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THE AMPHIBIANS OF THE SOLOMON ISLANDS

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WITH EIGHT PLATES

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No. 1. — *The Amphibians of the Solomon Islands*[1]

By Walter C. Brown

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INTRODUCTION

The first general account of the herpetofauna of the Solomon Islands was that of Boulenger (1886). In that account he gave detailed descriptions of the nine species of amphibians and the nineteen species of reptiles then known to inhabit this archipelago. At that time all of these amphibians and five species of the reptiles were known only from the Solomons.

In the second general study of this herpetofauna (Kinghorn, 1928) the number of species of amphibians listed was still nine while the number of reptiles had increased to thirty-five. The amphibian list differed, however, from that of Boulenger in that two of the species on his list had been placed in synonymy and two species which had been discovered in the intervening period were included.

Since 1928, six species and subspecies of amphibians, including those described by the present writer, have been recognized from the Solomons; two earlier described species have been revived; and one species from the Americas has been introduced. Thus, eighteen species and subspecies are now known.

This growing list of species, which are recorded in numerous, scattered papers, as well as the recent collections made by various men at the time of the occupation of these islands by the United States military forces, make timely a preliminary revision and summary of our knowledge of this part of the fauna of this zoogeographically important archipelago.

A total of 1044 amphibian specimens from the Solomons have been examined during the course of the present study.[1] In some instances the available material has shown the existence of subspecific populations within the Archipelago. In other instances suspected populations are represented by inadequate samples and no prediction as to their racial distinctness is made at this time.

The number of new forms discovered in recent collections, in correlation with our relatively limited knowledge of the interior portions of many of the islands, suggests that additional new species may well remain to be discovered. Certainly the opposite conjecture (Boulenger, 1888a and Barbour, 1921) that the herpetofauna of the Solomons was probably well known has not been substantiated.

This study, as well as the author's work with the herpetofaunas of other Pacific island groups, has shown the great difficulty of determining phylogenetic affinities and the most probable distributional paths. There is a great need of generic and family revisions in both the

[1] Eighty-four of these are not listed in this paper because they are to be reported by other workers.

amphibian and reptilian faunas which would include all the forms known to inhabit any part of this island region and also their Australian and Asiatic relatives.

Acknowledgments

An expression of thanks is due especially to Dr. George S. Myers of the Natural History Museum at Stanford University and Mr. Arthur Loveridge of the Museum of Comparative Zoology at Harvard College who have assisted most generously with both time and knowledge. I also wish to thank Dr. H. W. Parker of the British Museum for making available to me unpublished distributional tables of the herpetofauna of these islands. I am also deeply indebted to the following persons who have permitted me unlimited use of the Solomon Islands collections deposited at the institutions with which they are associated: Mr. Charles M. Bogert of the American Museum of Natural History, New York; Dr. Doris M. Cochran of the United States National Museum, Washington, D. C.; Mr. Joseph R. Slevin of the California Academy of Sciences, San Francisco; Dr. Lawrence M. Klauber of San Diego, California; Dr. Robert C. Stebbins of the Museum of Vertebrate Zoology, University of California, Berkeley. Thanks are due Dr. Robert Mertens of Senckenberg Museum, Germany; Mr. Karl P. Schmidt and Mr. Clifford H. Pope of the Chicago Natural History Museum and Dr. Vasco M. Tanner of Brigham Young University for the loan of critical material whenever it was needed, even though their Solomon Islands collections were being studied by themselves or other workers at this time. I am also indebted to Mr. Walter L. Necker of Chicago who was so kind as to give his assent to the use of some of his material deposited in the National Museum.

Finally, I wish to acknowledge my indebtedness to Miss Virginia Field for some of the drawings of *Batrachylodes* and *Hyla thesaurensis*, Mr. William Theiss for the full-figure drawings of *Batrachylodes trossulus* and *Platymantis myersi* and especially to Miss Jean Allred for the preparation of all the other drawings illustrating the text and to Mrs. Charles S. Richards and my wife, Jeanette S. Brown, who patiently typed and corrected the manuscript.

The field work which provided the collections directly used in this study was conducted by: William M. Mann for the Museum of Comparative Zoology, 1916; J. A. Kusche for the California Academy of Sciences, 1921; Rollo H. Beck for the American Museum of Natural History, 1920–1928; Karl P. Schmidt for the Chicago Natural History Museum, 1929; Maurice Willows, Jr. for the California Academy of

Sciences, 1933; Lowell Adams for the Museum of Vertebrate Zoology, 1944; D. Eldon Beck for Brigham Young University, 1944–1945; John Chattin for the Museum of Vertebrate Zoology, 1944; J. A. Gray for the Museum of Vertebrate Zoology, 1944; J. P. Heath for the Natural History Museum of Stanford University, 1944; L. W. Jarcho for the Museum of Comparative Zoology, 1943–1944; D. H. Johnson for the United States National Museum, 1944; Walter L. Necker for the United States National Museum, 1944; R. C. Pendleton for Brigham Young University, 1944; Ernest Reimschissel for Brigham Young University, 1944; Charles G. Sibley for the Museum of Vertebrate Zoology, 1944.

Gazetteer of Solomons Collecting Stations

In the following list of localities, whether small, generally unnamed islands on the ordinarily available maps or known collecting stations on the larger islands, latitude and longitude as well as synonyms occurring in the literature are given. Latitudes and longitudes were determined largely from tables in the United States Navy Department Gazetteer, H. O. Pub. No. 881, July, 1944.

Locality	*Remarks*	*Lat. S.*	*Long. E.*
Arnavon Id.	(Isabel group, off northwest coast)	7°26′	158°01′
Ata (see Atta)			
Atta, Malaita Id.	(cove area on northeast coast)	8°31′	160°50′
Auki, Malaita Id.	(village on west coast)	8°47′	160°43′
Banika Id.	(2nd largest in Russell group)	9°05′	159°13′
Bio Id.	(San Cristobal group, off north coast)	10°10′	161°41′
Fauro (Faro) Id.	(Bougainville group, off south coast)	7°47′	158°37′
Florida Id.	(Nggela group, between Guadalcanal and Malaita Ids.)	9°05′	160°16′
Fulakora Pt., Isabel Id.	(east coast near southern end)	8°21′	159°51′
Gatukai Id.	(New Georgia group, southeast end)	8°47′	158°12′
Gela Id.	(not positively known, perhaps in Florida group)		
Gizo Id.	(New Georgia group, northwest end)	8°05′	156°49′
Ganongga Id.	(see Ronongo Id.)		
Kirigi River area, Florida Id.		9°08′	160°16′
Kolombangara Id.	(New Georgia group, northwest end)	8°00′	157°05′
Mono Id.	(Bougainville group, south end)	7°22′	155°35′
Munda, New Georgia	(southwest coastal area of New Georgia)	8°19′	157°15′

Locality	*Remarks*	*Lat. S.*	*Long. E.*
Narovo Id.	(New Georgia group, southwestern end)	8°16′	156°31′
Nggela Id.	(see Florida Id.)		
Puruata Id.	(Bougainville group, off western coast)	6°15′	155°05′
Rendova Id.	(New Georgia group, off southwestern coast)	8°31′	157°20′
Ronongo Id.	(New Georgia group, northwest end)	8°03′	156°35′
Roviana Lagoon area, New Georgia Id.		8°16′	157°17′
Rubiana Lagoon area	= Roviana Lagoon area		
Russell Id.	(between New Georgia and Guadalcanal)	9°04′	159°12′
Santa Ana Id.	(San Cristobal group, southeast end)	10°50′	162°28′
Santa Ysabel Id.	(see Isabel Id.)		
Simbo Id.	(see Narovo Id.)		
Shortland Id.	(Bougainville group, southern end)	7°03′	155°47′
Stirling Id.	(Bougainville group, southern end)	7°25′	155°35′
Tenaru River	(Guadalcanal Id., north coast)	9°25′	160°07′
Tertere area	(Guadalcanal Id., north coast)	9°25′	160°14′
Torokina Pt. area	(Bougainville Id., west coast)	6°22′	155°01′
Treasury Id.	(see Mono Id.)		
Tulagi Id.	(small island in Florida group)	9°06′	160°09′
Ugi Id.	(San Cristobal group off northeast coast)	10°14′	161°44′
Vangunu Id.	(New Georgia group off southeast end)	8°39′	158°00′
Vella Lavella Id.	(New Georgia group, northwest end)	7°43′	156°40′
Yandina, Pavuvu Id.	(Russell group)	9°07′	159°13′

List of Nomenclatural Changes

Platymantis weberi = *Platymantis papuensis weberi*
Rana bufoniformis = *Discodeles bufoniformis*
Rana guppyi = *Discodeles guppyi*
Rana opisthodon = *Discodeles opisthodon*
Rana krefftii = *Rana papua krefftii*

List of Amphibians Known From the Solomon Islands

List of Extralimital Amphibians Discussed in the Text

Notes on the Geology and Geography of the Solomon Islands

A study of the relationship of any element of the fauna of these islands to corresponding elements in surrounding island areas necessitates some consideration of the general features of their geology and geography. This is necessary in order to determine the possible bearing of these factors on the distributional and evolutionary patterns which systematic considerations suggest.

Chubb (1934, pp. 289–302) calls attention to the fact that the andesitic zone which borders the Pacific shores of the American and Asiatic continents includes a roughly quadrangular, submerged area extending far into the Pacific Ocean from southeastern Asia. Its northeastern border extends from the island of Honshu through the Caroline Islands to a point just northeast of the Fijis; the shorter

southeastern border extends southwestward to a point near the eastern shore of South Island, New Zealand; the long southwestern border lies between Australia and New Guinea and along the southern shores of the lesser Sundas, Java and Sumatra. This area is presumed to represent a continental extension subjected to extensive fracture and eruptive emergence during Mesozoic and Tertiary times. Many of the island groups within these limits tend to lie in northwest-southeast lines or arcs in the form of ridges but partly raised above the level of the ocean. These marginal, exposed ridges, according to one hypothesis, have probably never been directly connected to the adjacent continental mass. The fluctuations in the level of the now submerged portions of these ridges and the interlying basins can be presumed only on the indirect evidence of floral and faunal relationships and the direct evidence buried beneath the ocean floor (see also Myers, 1950).

The Solomons Archipelago forms a double chain some 600 miles in length (exclusive of the Santa Cruz group). This extends in a west-northwest to east-southeast line and apparently forms a continuation of the ridge system occupied by New Ireland and the Admiralty Islands. There are seven major groups of islands in the Solomons: the Bougainville, Choiseul, Isabel and Malaita groups on the north chain; the New Georgia, Guadalcanal and San Cristobal on the south. These do not represent two strictly parallel ridges, however. Bougainville, Choiseul, Isabel and Guadalcanal groups rest on one continuous undersea plateau which is submerged to a depth of not more than 600 fathoms; the other groups, New Georgia, Malaita and San Cristobal, are separated from this plateau and from each other by basins of greater depth, 1000 to 2000 fathoms (Lever, 1937, p. 272).

The larger islands, as Guadalcanal and Bougainville, are marked by a series of volcanic peaks, generally inactive in very recent history, which may attain heights of 8,000 to 10,000 feet.

Old volcanic rocks are now covered by sedimentary rocks generally only at lower altitudes, having been denuded at heights above 600 to 1000 feet. There is evidence, however, based on these remaining sedimentary rocks, that they were formed, in part at least, at depths of 12,000 feet or more beneath the surface of the ocean. This, if true, attests to the great orogenic changes which have taken place in this region.

The distances which now separate these major island groups within the Archipelago as well as that between the most northern group and the Bismarck Islands are not great. This in correlation with certain features of climate and ocean currents may have some bearing on the distribution of some elements of the fauna. These distances are given in the following table to the nearest mile (+ or −) as determined from

the U. S. Navy hydrographic charts, 1945 edition (Nos. 5593, 5912, 2896, 2926, 5967, and 2920).

New Guinea	Rooke (Umboi)	29−
Rooke	New Britain	12±
New Guinea	Manus (Admiralties)	175
Manus	Mussau	150
New Britain	New Ireland	20+
New Ireland	Nissan Island	70−
Nissan	Buka	42−
New Ireland	Buka	105
Buka	Bougainville	2 or 3
Bougainville	Shortland	6+
Bougainville	Fauro	9−
Shortland	Mono	17+
Mono	Vella Lavella	60+
Bougainville	Choiseul	30+
Vella Lavella	Kolombangara	15−
Kolombangara	Arundel	1±
Arundel	New Georgia	2−
Choiseul	Rob Roy	1±
Rob Roy	Wagina	5+
Wagina	Arnavon	12±
Arnavon	Gagi	12−
Wagina	Gagi	26+
Gagi	Barola	1±
Barola	Isabel	1±
Isabel	New Georgia	65+
Isabel	Malaita	50−
Isabel	Florida	35−
Isabel	Guadalcanal	50−
Florida	Guadalcanal	15−
New Georgia	Vangunu	1±
Vangunu	Gatukai	5−
Gatukai	Pavuvu	60+
Gatukai	Guadalcanal	100
Pavuvu	Guadalcanal	32+
Florida	Malaita	25+
Guadalcanal	Malaita	32+
Guadalcanal	San Cristobal	35±
Guadalcanal	Rennell	105
San Cristobal	Rennell	100
San Cristobal	Malaita	40−

The breadth of the present ocean basins between the larger islands of the seven primary groups ranges from about 25 to 100 miles. It should

be noted, however, that the greater distances are in all instances reduced by the presence of small islands at intermediate points. These small islands might well function as stepping stones in the process of faunal dispersal by flotsam methods.

The humid, tropical climate and heavy rainfall support a rich covering of vegetation, mainly tropical forest. There are, however, extensive grassy areas on some of the larger islands, Guadalcanal, for example (Guppy, 1887b, p. 25). Short, often large, and generally rapid streams occur on the islands but freshwater lakes are few.

Nature and Distribution of the Amphibian Fauna

The amphibian fauna of the Solomon Islands is zoogeographically very interesting because of the highly endemic nature of its ranid component and the fact that this Archipelago is, with the Fijis and New Zealand, a Pacific amphibian outpost. Three genera, *Batrachylodes, Ceratobatrachus* and *Palmatorappia,* are known only from the Solomons. *Discodeles* has been recorded for the Bismarcks and the Admiralties outside of the Solomons. *Cornufer* and *Platymantis* have more extended ranges. Both are represented by distinct species in the Fiji Islands to the east (see Brown and Myers, 1949a), while *Platymantis* ranges west to Borneo and *Cornufer* as far as Burma. Both occur also in the Philippines.

All of these genera (*Batrachylodes* possibly excepted) are apparently closely related, as held by Noble (1931, pp. 522–524). They are possibly descended from a single, more primitive ranid stock. However, further work both from the anatomical and embryological approaches is needed in order to outline with greater assurance the probable lines of evolution within the group and to reconstruct the theoretical prototype or prototypes.

The close relationship between *Ceratobatrachus, Cornufer, Discodeles* and *Platymantis* is shown not only in such skeletal features as the broadly forked omosternal style and the large, broad nasals, but also in certain reproductive modifications. The eggs of species within these genera, as far as I have been able to observe (fourteen of twenty-nine recognized species), are relatively large and unpigmented. This suggests that the larvae of all the species may complete their development within the egg capsule as is, indeed, known for *Cornufer guentheri* and *Discodeles opisthodon.* Maturing, ovarian eggs of *Palmatorappia* are unpigmented.

In *Batrachylodes* the omosternal style is unforked and it may possibly be derived from a hylaranid stock as Noble (1931, p. 521)

proposes for *Micrixalus* and *Simomantis*. However, eggs of *B. trossulus* are relatively large and unpigmented and a modification of developmental habits similar to that of the genera *Cornufer* and *Discodeles* is also suggested for this genus.

The Solomons representatives of *Platymantis* and *Cornufer*, the only two genera having ranges known to extend much beyond the Archipelago, appear to have their closest affinities with Fijian and New Guinean species. In the first-mentioned genus *P. solomonis* is probably most closely related to *P. vitianus* of the Fijis, both are very large, rather smooth forms; *P. aculeodactylus* is closely related to *P. cheesmanae* of New Guinea; *P. myersi* may have its closest affinities with *P. beauforti* of New Guinea; and *P. papuensis weberi* is regarded as but subspecifically differentiated from *P. papuensis papuensis* of New Guinea. In the second genus *C. guppyi* is related to *C. vitiensis* of the Fijis but is a larger form, while *C. neckeri* is a very distinct species and appears not to be related closely to other known forms.

The presumably phylogenetically older hylids, so numerous in Australia and New Guinea, are represented by only two known species. One of these, *Hyla thesaurensis*, is also recorded from New Guinea.[1] *Rana* (*Hylarana*) is also known from only two representatives and both are regarded as subspecifically related to the common New Guinean form, *Rana* (*Hylarana*) *papua papua*. The members of these two genera, as far as known from the Solomons, lay small, typically pigmented eggs. This suggests, as is known for *Hyla thesaurensis*, that the eggs are laid in permanent or semi-permanent bodies of water and that the larvae undergo a period of development and metamorphosis after hatching.

Thus the amphibian fauna of the Solomons appears to be comprised of two elements. The older element is a rather closely related, possibly diphyletic, endemic group of highly specialized ranid frogs, the members of *Batrachylodes, Ceratobatrachus, Cornufer, Discodeles, Palmatorappia,* and *Platymantis* (in part). The more recent element appears to include members of *Hyla, Rana* (*Hylarana*) and two (possibly three) species of *Platymantis*.

The older ranid element has its present center of abundance in the Solomons Archipelago and possibly the Bismarcks. Only two of the genera, as already noted, have ranges much beyond this region. Two hypothetical explanations are suggested for the more extended ranges of *Platymantis* and *Cornufer:* (1) that they represent the older, more widely dispersed, possibly ancestral genera as held by Noble (1931,

[1] The possible subspecific status of this New Guinean population remains for future investigation.

pp. 521–524) or (2) that they have simply been the more successful in spreading through an island range.

The specialization of large, unpigmented eggs, and probably general practice of direct development, parallels that of certain plethodontids, brevicipitids, and leptodactylids. Such a specialization, it may be hypothesized, could have enabled these frogs to maintain themselves near their present center in the Solomon Islands at some time in the past, under conditions when permanent or semipermanent bodies of still or slow moving water may have been less readily available as breeding sites. On the other hand, the Hylas and Hylaranas, which on the basis of their closer affinities with the New Guinean forms would appear to be later arrivals, may have been able only to invade or at least maintain themselves in the Solomons when suitable breeding sites became more generally available. To this group of later arrivals would also belong the two (or three) species of *Platymantis*, which are very closely related to the Papuan species.

Geological evidence, as far as known, would in general be consistent with this hypothesis of a possible change in the physical nature of the islands in relatively recent times. There has been a general uplifting of many of the islands to a height of sometimes hundreds of feet (Guppy, 1887b, pp. 125–136). Their general profile suggests that prior to this they may have been even more steep and rugged, mountainous islands with more limited marginal lowland areas.

When the amphibian faunas of different island groups within the Solomons are compared, in contrast to comparisons of the fauna of the Archipelago as a whole with those of the Bismarcks and New Guinea, a striking general homogeneity is observed. This is modified in two ways, however: (1) the northern group of islands, Bougainville and Choiseul, appear to have a richer amphibian fauna and San Cristobal at the extreme south the poorest; (2) inter-island subspecific populations are known for some species and when more extensive collections become available may be substantiated for others.

The more limited fauna of the San Cristobal group suggests that the southern part of the chain has perhaps always been more completely isolated and lends support to the hypothesis that the island groups (or perhaps the four primary, submarine plateaus) have always been more or less separated by barriers such as marine basins which have acted as distributional filters. At the same time, the two factors, (1) a homogeneous, highly endemic fauna and (2) a fauna apparently derived from at least two invasions widely separated in time, suggest a probably greater isolation of the Archipelago as a whole at some intermediate period in the past and also possibly closer connections between at least some of the island groups within the Archipelago.

	Solomon Islands	Bougainville Group: Buka	Bougainville	Puruata	Fauro (Faro)	Shortland (Alu)	Mono (Treasury)	Stirling	Choiseul	Isabel Group: Arnavon	Isabel (Santa-Ysabel)	New Geo Grou: Vella Lavella	Ronongo (Ganongga)	Nasoro (Simbo)
Bufo m. marinus														
Hyla lutea			○ –				T ○		–					
Hyla thesaurensis	–	○	○ + * –	–			T * ○ –				* –			
Batrachylodes trossulus			T –						–					
Batrachylodes vertebralis		+	–		T * ○						○		* –	
Ceratobatrachus guentheri	–		○ –		T * ○ –	T * ○ –	T * ○ –	–	–		* ○ –	–		
Cornufer guppyi			○ –		* ○		T * ○ –		* –	–	* ○ –		*	
Cornufer neckeri			T –											
Discodeles bufoniformis			○ –		* ○		T * ○ –		–		○ –	–	–	
Discodeles guppyi			○ –		* ○	T * ○					* ○			
Discodeles opisthodon	–		–		T ○ –	 ○	T ○							
Palmatorappia solomonis		T ○ –									+			
Platymantis aculeodactylus			T –						–					
Platymantis myersi			T –											
Platymantis papuensis weberi			–								* ○ –	–		
Platymantis solomonis		○	○ –	–	T * ○	T * ○	T * ○ –	–	–	–	○ –			
Rana papua krefftii														
Rana papua novaebritanniae			–								*1 + –			

T Type locality.
– Specimens identified in present study.
○ Reported in the literature but not examined in the present study.
+ Based on records in the literature of species regarded as synonyms.
* Reported to be in the collections of the British Museum (Natural History).
1 Specimens in the British Museum which are here referred to *novaebritanniae* are catalogued as *krefftii*. However, on the basis of the present study these islands are occupied by the subspecies *novaebritanniae*.

New Georgia Group				Russell Group			Guadalcanal Group				Malaita	San Cristobal Group					
New Georgia	Rendova (Hammond)	Vangunu	Gatukai	Russell Islands	Pavuvu	Banika	Guadalcanal	Savo	Florida (Nggela)	Tulagi		San Cristobal	Ugi	Bio	Malaulalo	Malaupaino	Santa Ana
						○ –	○ –										
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							*1 + –			–	+ –						

I. A specimen from Fauro Island in the British Museum, referred by Boulenger (1887) to *Cornufer dorsalis*, is regarded as an error and is not recorded here.

II. Specimens of *Hyla thesaurensis* and *Ceratobatrachus guentheri* in the British Museum from Gela Island are not shown in the chart. The exact location of this island is unknown to me, but it is suspected that it may be a small island perhaps in the Florida group.

III. Two specimens, reported as *Cornufer corrugatus* by Sternfeld (1920 [1921]) from Buka Island, may be either *Platymantis papuensis weberi*, *P. solomonis* or possibly some other species and hence are not shown on the chart.

The probability of occasional population interchanges between islands by rafting is supported by the observations of Guppy (1887b, pp. 125–144). Commenting on the rapid denudation of the higher parts of the islands, he describes the frequent torrential flooding of the streams and the extensive muddying of the sea by this debris for a distance of at least a third of a mile from shore following the frequent heavy tropical rains. He also comments on the extensiveness of the pumice drift reaching the shores of the Solomons following the volcanic eruption at Blanche Bay, New Britain, May 1878, borne there by the eastward-moving ocean currents.

Further geological information concerning past land fluctuations in this general region of the Pacific basin area may in the future help to clarify our understanding of some rather puzzling distributions and may point the way to a better understanding of phylogenetic relationships.

Treatment of Data in the Systematic Section

The descriptions of the species which are discussed in the systematic part are sufficiently detailed, it is hoped, to enable workers to avoid some of the errors in identification to which overly brief descriptions have frequently lent themselves in the past. Whenever sufficiently large series of mature or near-mature specimens were available from any one island, such series were the only ones used in determining the means and their standard errors of measurements or body proportions given in the descriptions. This was done to facilitate comparisons by those working with series from other islands where possible island races may exist.

Measurements were made as follows: length of head, along the side from the tip of the snout to the posterior edge of the tympanum unless otherwise stated; breadth of head, at the angle of the jaws; diameter of the eye, along the anteroposterior axis; length of tibia, in the flesh.

Body proportions used were: (1) head width/length from snout to vent, head width/length of tibia, length of tibia/length from snout to vent, diameter of eye/head width, diameter of tympanum/head width, and diameter of tympanum/diameter of eye. The mean and its standard error are given in each case.

When samples of populations were compared to determine the possible significance of differences in the means of measurements or body proportions, Student's "t" was calculated taking into consideration the small size of the samples.

For the sake of brevity the following abbreviations have been used throughout the text with reference to collections of various institutions:

American Museum of Natural History (A.M.N.H.), California Academy of Sciences (C.A.S.), Museum of Comparative Zoölogy, Harvard (M.C.Z.), Museum of Vertebrate Zoology, University of California (M.V.Z.), San Diego Society of Natural History (S.D.S. N.H.), Natural History Museum, Stanford University (S.N.H.M.), United States National Museum (U.S.N.M.).

SYSTEMATIC DISCUSSION

Key to the families of amphibians in the Solomon Islands

1. The halves of the pectoral girdle fused ventrally.....Ranidae
   The halves of the pectoral girdle overlapping ventrally.....2
2. Intercalary cartilages present; terminal phalanges claw-shaped...
   .....Hylidae
   Intercalary cartilages absent; terminal phalanges straight or nearly so (not claw-shaped).....Bufonidae

BUFONIDAE

The only representative of this family known from the Solomon Islands, *Bufo marinus marinus* (Linné), was introduced, presumably early in 1940 (Lever, 1945, p. 1).

Genus BUFO Laurenti

BUFO MARINUS MARINUS[1] (Linné)

Rana marina Linné, 1758, Systemae Naturae (ed. 10), p. 211: America.
Bufo marinus Lever, 1945, p. 1.

26 larvae (M.C.Z. 26008–9) Guadalcanal Id. (L. W. Jarcho) 1944.
2 (U.S.N.M. 119624–5) Lunga area, Guadalcanal Id. (D. H. Johnson) 1944.
6 larvae (A.M.N.H. 51958) Guadalcanal Id.
12 (M.V.Z. 39648–59) Banika Id. (J. A. Gray) 1944.
2 (M.V.Z. 40731–32) Guadalcanal Id. (Lowell Adams) 1944.
1 (S.D.S.N.H. 18019) Guadalcanal Id.

Description. Head broader than long; snout rounded; canthus rostralis forming a prominent crest continuous with the preorbital and supraciliary crests; postorbital crest reaching a point almost as far ventral as the center of the tympanum; supratympanic crest extending

[1] These specimens have been compared with the description of *Bufo marinus paracnemis* (Lutz).

from the postorbital portion of the supraciliary crest to the anterior border of the parotid gland; loreal region nearly vertical, tuberculate; interorbital region concave with scattered, moderate warts; parotid glands large, heavily pitted, reaching posterior to the axillary region; upper eyelids strongly rugose; roof of mouth with a transverse ridge just posterior to the choanae, strongly projecting laterally but low near the mid-point; tongue broadly oval without a median notch posteriorly.

Forelimb well developed; first finger much longer than the second; subarticular tubercles moderately large, rounded, less broad than the subtending digit; inner metacarpal tubercle narrow; outer broadly oval; hindlimb relatively short, heels failing to meet when limbs are folded at right angles to the body; length of the tibia somewhat less than, or equal to, the breadth of the head; toes about 1/3 webbed, the distal 3 phalanges of the fourth toe being free; subarticular tubercles small, round to oval, narrower than the subtending digit; inner metatarsal tubercle prominent, narrowly oval or elliptical; outer smaller, less protrudent; dorsum and lateral surfaces marked by rows of warts, those of the dorsum larger; venter granulate, granules with brown-tipped centers except in the region of the hindlimbs; limbs profusely tuberculate or warty on upper surfaces.

Color of the Marine Toad, as in its native habitat, the tropical New World, is highly variable. The dorsum (in preservative) shows various shades of brown or gray. The top of the head, middorsal line and lateral surfaces are generally lighter as are the larger warts and tubercles. The warts and tubercles are, however, brown-tipped. The venter is grayish or yellowish, somewhat marbled with darker gray or brown.

It may be noted that tadpoles were collected on Guadalcanal both in June and November.

Range. Definitely known from Guadalcanal, Malaita and Banika as well as perhaps other islands in the Russell group. This species has also been introduced into the Admiralties; U.S.N.M. 121854–5 are from Manus Island and 121660–2 are from Los Negros.

HYLIDAE

Genus HYLA Laurenti

Parker (1939, p. 2) regarded *H. lutea* as definitely distinct from *H. thesaurensis* whereas van Kampen (1923, p. 50) was somewhat doubtful following Barbour's relegating it to the synonymy of the latter (Barbour 1921, p. 93). Parker noted among other characters

the more extensive webbing of the fingers, the larger size and the longer, more pointed snout of *H. lutea*. That the snout is longer is not borne out by the present series, its ratio to head width or total length being approximately the same for both species. However, the distinctness of *H. lutea* from *H. thesaurensis* in other respects is amply evidenced.

The following key serves to separate these two species:

Head moderately depressed; disk of third finger generally smaller than tympanum; disks of fingers (except the inner one) much broader than the subtending digit which is not bordered by a wide flange of skin. . . . *thesaurensis*
Head much depressed; disk of third finger generally larger than tympanum; disks of fingers not or scarcely broader than the subtending digit which is bordered by a wide flange of skin. . . . . *lutea*

Hyla lutea Boulenger

(Pl. 4, fig. 2)

Hyla lutea Boulenger, 1887, Proc. Zool. Soc. London, 1887, p. 337, pl. xxviii, fig. 4; Fauro Id., Solomon Ids. (Type in British Museum).
Hyla thesaurensis (part), Burt and Burt, 1932, p. 488.
Cornufer guppyi (part), Burt and Burt, 1932, p. 489.
4 (A.M.N.H. 34273, 35342, 35344–5) Bougainville Id. (Whitney Exped.).
3 (A.M.N.H. 34636–7, 35387) Choiseul Id. (Whitney Exped.).
1 (S.N.H.M. 9346) Bougainville Id. (Exch. Amer. Mus.).

Description. Head slightly less broad to as broad as long, its breadth about 1/3 the length from snout to vent; snout round-pointed; eye moderate, its diameter about 1/3 the breadth of the head; tympanum round, its diameter 1/2 or slightly more than that of the eye; loreal region strongly oblique, concave; canthus rostralis rounded, rather indistinct; interorbital space broader than upper eyelid; vomerine teeth in two transverse patches between the choanae and almost in contact medially; tongue broadly oval and but feebly indented at the mid-point of the posterior margin.

Forelimb well developed; finger tips strongly depressed with large disks; disks broader than long (except for the inner finger), but scarcely broader than the subtending digits as measured to include the flanges of skin on the lateral margins; fingers more extensively webbed than in *H. thesaurensis*, the third finger being webbed to the subdistal tubercle on the outside and to a point between this and the basal tubercle on the inside, the second almost to the distal tubercle on the

outside; subarticular tubercles small, low, transversely elongate; metacarpal tubercles indistinct; hindlimb long, length of tibia about 3/5 the length from snout to vent; disks of toes smaller than those of fingers; subarticular tubercles small, more strongly protrudent than those of hands; inner metatarsal tubercle narrow elliptical, its length less than its distance from the basal tubercle of the inner toe; outer absent; toes webbed almost to the disks except for the fourth; skin smooth except for the flat granules of the lower surfaces of the thighs and abdomen.

Color (in preservative) of the dorsum is quite uniformly grayish or yellowish tan for these eight specimens; somewhat lighter on the venter.

Measurements	♂ (S.N.H.M. 9346)	♀ (A.M.N.H. 34273)
Snout to vent	54 mm.	65.5 mm.
Snout length	9 "	11 "
Head length (to base of skull)	16 "	19 "
Head breadth	17 "	22 "
Eye diameter	6 "	6.5 "
Tympanum diameter	3 "	3.75 "
Tibia length	30 "	39 "

Range. Known from Bougainville, Mono and Choiseul Islands.

Hyla thesaurensis Peters

(Pl. 3, figs. 1, 2)

Hyla thesaurensis Peters, 1877, Monatsb. Akad. Wiss. Berlin, p. 421: Treasury Id., Solomon Ids. (Type in Berlin).

Hyla macrops Boulenger, 1883, Ann. Mag. Nat. Hist. (5), xii, p. 164: Treasury Id., Solomon Ids. (Type in British Museum).

Hyla solomonis Vogt, 1912, Sitzb. Ges. Naturf. Freunde Berlin, p. 10: Bougainville Id., Solomon Ids. (Type probably in Berlin).

Hyla thesaurensis (part), Burt and Burt, 1932, p. 488.

1	(M.C.Z. 7373)	Fulakora, Isabel Id.	(W. M. Mann) 1916.
2	(" 7374–75)	Auki, Malaita Id.	" "
3	(" 7376–8)	Tulagi Id.	" "
10	(" 7379–88)	Atta, Malaita Id.	" "
3	(" 7390, 7392–93)	Isabel Id.	" "
4	(" 7401–4)	Yandina, Pavuvu Id.	" "
1	(" 7405)	Rubiana Lagoon area, New Georgia Id.	" "
1	(" 9374)	German Solomon Ids.	(Exch. Berlin Mus.) 1922.
1	(" 26051)	Guadalcanal Id.	(L. W. Jarcho) 1943.
2	(" 26052–3)	" " "	1943.

1 (S.N.H.M. 8390) Tetere area, Guadalcanal Id. (J. P. Heath) 1944.
2 (C.A.S. 49952–3) Guadalcanal Id. (J. A. Kusche) 1920.
6 (" 49956–61) " " " 1921.
1 (" 54665) Malaita Id. (W. M. Mann) 1916.
1 (" 72100) " " (Crocker Exped.) 1933.
24 (U.S.N.M. 119560–5, 119567–75, 119756–64) Torokina Pt., Bougainville Id. (W. L. Necker and D. H. Johnson).
38 juvs. and larvae (U.S.N.M. 119765) Torokina Pt., Bougainville Id. (W. L. Necker and D. H. Johnson).
1 (U.S.N.M. 119566) Puruata Id. (W.L. Necker and D.H. Johnson).
1 (" 119721) Mono Id. " "
2 (M.V.Z. 40733–4) Malumba River area, Guadalcanal Id. (Lowell Adams) 1944.
3 (M.V.Z. 44189–90, 44223) lower Lunga River area, Guadalcanal Id. (J. Chattin) 1944.
2 (S.D.S.N.H. 18057–8) Russell Ids.
4 (A.M.N.H. 34320, 35327, 35339, 35346) Bougainville Id. (Whitney Exped.) 1930.
1 (A.M.N.H. 35423) Mono Id. (Whitney Exped.) 1930.
1 (" 39998) Central Malaita Id. (Whitney Exped.) 1930.
72 ♂♂, ♀♀, juvs., and larvae (A.M.N.H. 51959–75) Guadalcanal Id. 1944.
8 ♂♂, ♀♀ (A.M.N.H. 52173, 52176–79) Guadalcanal Id. 1945.

Hyla thesaurensis is highly variable as to color and may prove to be constituted of at least two geographical races or be undergoing such differentiation. Only from the southwestern islands have I observed occasional specimens heavily mottled with dark-brown on the throat and chin. However, the majority of the specimens from these islands possesses the uniformly light venter and lower lip. Therefore I have chosen to regard *H. thesaurensis* as a highly variable species until larger series are available from many more of the islands.

Description. Head slightly less broad to as broad as long, its breadth about 1/3 the length from snout to vent, depressed but less so than for *H. lutea;* snout rounded, its length less than 1/2 the breadth of the head (45.99% ± .692 for 24 specimens from the Bougainville group); eye moderate, its diameter 1/3 to about 2/5 the breadth of the head (38.18% ± .647 for 24 specimens); tympanum large, its diameter generally about 1/2 that of the eye (49.83% ± 1.44 for 24 specimens); interorbital space broader than the upper eyelid; loreal region slightly oblique, shallowly concave; canthus rostralis distinct, slightly rounded; vomerine teeth in two short, narrowly separated, transverse or slightly oblique patches between the choanae or their posterior borders; tongue broad with a shallow notch at the mid-point of the posterior margin.

Forelimb well developed; fingers with large, rounded or transversely elliptical disks at the tips; disks (except for inner finger) much broader than the subtending digit which is bordered at most by only a narrow flange of skin on the lateral margins; disk of third finger much smaller than, or equal to, the tympanum; fingers with slight or moderate webs, reaching the basal tubercle on the inside and about halfway between the basal and subdistal tubercles on the outside of the third finger, and the subdistal tubercle on the outside of the second; subarticular tubercles moderately protrudent (except the distal ones), transversely elliptical; inner metacarpal tubercle narrow elliptical; middle and outer shorter; hindlimb long, tibia length about 1/2 to 3/5 the length from snout to vent (58.42% ≐ .514 for 24 specimens); disks of toes somewhat smaller than those of fingers; subarticular tubercles moderate, round or transversely elongate, smaller than those of hands; inner metatarsal tubercle narrow elliptical, short, its length less than its distance from the subarticular tubercle of the inner toe; outer small, round; toes webbed almost to the disks except for the fourth; skin smooth on the dorsum or occasionally with a few, scattered granulations; venter with moderate granules posterior to the pectoral region and sometimes on the chin as well; lower proximal region of the thighs granular.

Color (in preservative) of the dorsum highly variable, being light-grayish to olive-brown, often with darker mottling; the three white lines along the back, as originally described by Peters (1877, p. 421) and figured by Boulenger (1886, fig. 4), present or absent, or broken, more commonly present in juveniles but also in some adults; venter white, yellowish or tan, throat and chin sometimes mottled with brown as observed for specimens from Guadalcanal Island.

Mature ovarian eggs are small and pigmented at the animal pole region.

Measurements	♂ (U.S.N.M. 119569)	♀ (U.S.N.M. 119721)
Snout to vent	40.5 mm.	49 mm.
Snout length	6 "	7 "
Head length (to posterior edge of tympanum)	13.5 "	17 "
Head breadth	12.5 "	17 "
Eye diameter	5 "	6.25 "
Tympanum diameter	2.5 "	3 "
Tibia length	23 "	28.5 "

Range. (see distributional chart)

Since a description of the larval stage of this species has apparently not been recorded in the literature the following notes are given, based on a series of larvae and transforming individuals (U.S.N.M. 119765).

One of the younger larvae with the forelimbs rather well developed but still beneath the operculum, measures 58 mm. in total length; vent to tip of tail 38 mm.; width of body 12 mm. (preserved condition); nostril to tip of snout 3 mm.; eye to nostril 3 mm.; interorbital space 6 mm.; width of mouth 4 mm.; greatest breadth of tail 9 mm. The mouth is antero-ventral in position. The lips are papillate except for the median third of the upper lip; the upper lip possesses two rows of horny teeth, the inner divided at the midline. The lower lip has three rows, the inner one also medianly divided. The edges of the jaws have a dark horny covering. The eyes are dorsolateral in position. The spiracle forms a narrow slit-like opening (1 mm. in length) slightly ventral to a line connecting the corner of the mouth and the groin on the left side and about equidistant from these two points of reference. The dorsal and ventral fins of the tail are of approximately equal width with the tip rounded, and heavily pigmented (dark grayish-brown in preservative).

RANIDAE

The following key will serve to distinguish the genera of the Ranidae known to occur in the Solomon Islands:

1. Omosternal style entire or with a very small notch at the base 2
   Omosternal style with a broad fork at the base 3
2. Vomerine teeth present; toes with webs ..... *Rana* (*Hylarana*)
   Vomerine teeth absent; toes without webs ..... *Batrachylodes*
3. Vomerine teeth absent; fingers with webs ..... *Palmatorappia*
   Vomerine teeth present; fingers without webs 4
4. Terminal phalanges broadly T-shaped; digital disks large; toes moderately webbed ..... *Cornufer*
   Terminal phalanges bluntly rounded 5
5. Digital disks small to large; toes moderately to almost fully webbed ..... *Discodeles*
   Digital disks small; toes without webs 6
6. Odontoids absent from lower jaw ..... *Platymantis*
   Odontoids present on lower jaw ..... *Ceratobatrachus*

Genus BATRACHYLODES Boulenger

This genus was originally set up by Boulenger (1887, p. 337) on the basis of a single female specimen of *B. vertebralis* from Fauro Island. Neither at that time nor in his later writings did he mention the possible relationship of *Batrachylodes* to other ranid genera. Noble (1931, p. 524), apparently without having seen a specimen, held it to

be a diminutive relative of *Cornufer* lacking vomerine teeth. Deckert (1938, p. 181), who also was unable to examine a specimen of the genus, follows Noble.

This proposed derivation from *Cornufer*, however, is not borne out when one examines closely the pectoral girdle. The omosternum, though broad at the base, is unforked. On the basis of this evidence, although *Batrachylodes* may have been derived from the same ranid stock as *Platymantis* and *Cornufer*, the undivided omosternum makes possible its origin in the *Hylarana* group as Noble (1931, p. 521) proposes for *Micrixalus* and *Staurois*.

Eggs are large and unpigmented as observed for *Batrachylodes trossulus*.

The following key serves to distinguish the two known species:

Disks of fingers and toes little dilated; breadth of disk of third finger about half diameter of tympanum ..... *trossulus*
Disks of fingers and toes broadly dilated; breadth of disk of third finger equal to or greater than diameter of tympanum ..... *vertebralis*

Batrachylodes trossulus Brown and Myers

(Pl. 6, fig. 3; Pl. 8, fig. 1)

Rana solomonis (part), Burt and Burt, 1932, p. 491.
Batrachylodes trossulus Brown and Myers, 1949b, Jour. Wash. Acad. Sci., vol. 39, no. 11, pp. 379–80; Torokina, Bougainville Id. (Type in United States National Museum).

7 (U.S.N.M. 119577 holotype, 119586–88, 119787–89) Torokina Pt., Bougainville Id. (W. L. Necker).
1 (A.M.N.H. 35425) Choiseul Id. (Whitney Exped.).

As no additional specimens of this small frog have been found in collections examined since its description was published in 1949, nothing more is known of its variability, and only a brief restatement of that description is given here.

Description. Head relatively narrow, its breadth about 1/3 the length of the body, 2/3 to 3/5 the length of the tibia; snout rather pointed, strongly projecting beyond the tip of the lower jaw, its length about 1/3 to 1/2 the breadth of the head; eye large, its diameter about equal to or slightly greater than the length of the snout; diameter of tympanum slightly more or less than 1/2 the diameter of the eye; loreal region nearly vertical; canthus rostralis somewhat rounded; vomerine teeth absent; tongue oval without a distinct notch posteriorly.

Forelimb moderately developed; fingers slender with small round disks at their tips, much smaller than in *B. vertebralis;* the inferior portion of the disk separated from the superior by a nearly terminal crescentic groove; diameter of the disk of the third finger about 1/2 that of the tympanum; terminal phalanx a narrow "T"; subarticular tubercles poorly or moderately developed; inner metacarpal tubercle broadly oval, moderate; middle one similar in size and development; outer one smaller; hindlimb rather well developed; length of the tibia about half the length of the body; heel reaching the eye; tips of toes expanded into large disks, larger than those of the fingers and slightly broader than long; subarticular tubercles moderately developed; inner metatarsal tubercle oval, elongate, its length about equal to its distance from the end of the outer toe; outer metatarsal tubercle moderate, round; toes without webs; skin smooth.

Color (in preservative) very uniform for the entire series from Bougainville Island; dorsum dusky gray suffused with pale reddish, most prominent on the hindlimbs; sides of head and body dark reddish-brown to black, bordered above by a light edge and continuous with the dark blotch on anteroventral surface of the forelimb; axillary surface of forelimb with an uneven-edged, dark slate or blackish band; as is also the anterior border of the thigh; anterior surface of lower leg with a more or less broken series of dark blotches or dashes; anal region and proximal portion of posterior surface of thighs blackish; under surface of head, throat and pectoral region dark reddish-brown with scattered light flecks; white nuptial tubercles on the chin and sometimes throat of males, belly and under surface of thighs whitish flecked with dark reddish-brown.

Ovarian eggs are unpigmented, large.

Measurements	♂ (U.S.N.M. 119577)	♀ (U.S.N.M. 119586)
Snout to vent	20.25 mm.	19 mm.
Snout length	3 "	2.5 "
Head length (to posterior edge of tympanum)	7 "	6.25 "
Head breadth	6.5 "	6.5 "
Eye diameter	3 "	3 "
Tympanum diameter	1.5 "	1.25 "
Tibia length	10 "	9.25 "

Range. Known from Bougainville and Choiseul Islands.[1]

[1] The Choiseul specimen differs greatly in color pattern from the Bougainville series and may represent a distinct race (see Brown and Myers 1949b).

Batrachylodes vertebralis Boulenger

(Pl. 1, fig. 1; Pl. 2, fig. 2; Pl. 6, fig. 2)

Batrachylodes vertebralis Boulenger, 1887, Proc. Zool. Soc. London, 1887, p. 337, pl. xxviii, fig. 3: Fauro Id., Solomon Ids. (Type in British Museum).

Chaperina fredericii Sternfeld, 1920 (1921), p. 435. (Type in Senckenberg Museum).

Sphenophryne wolfi Sternfeld, 1920 (1921), p. 435. (Type in Senckenberg Museum).

Platymantis solomonis (part), Barbour, 1921, p. 96.

Cornufer guppyi (part), Barbour, 1921, p. 97.

Cornufer guppyi (part), Burt and Burt, 1932, p. 489.

3 (M.C.Z. 7449–51) Rubiana Lagoon area, New Georgia Id. (W. M. Mann) 1916.

1 (M.C.Z. 7452) Santa Ana Id. (W. M. Mann) 1916.

4 (M.C.Z. 7455, 7457, 7589–90) Atta, Malaita Id. (W. M. Mann) 1916.

1 (A.M.N.H. 35427) Ronongo Id. (Whitney Exped.).

1 (M.V.Z. 44191) lower Lunga River, Guadalcanal Id. (J. Chattin) Aug. 8, 1944.

1 (M.V.Z. 44977) Munda, New Georgia Id. (C. G. Sibley) Nov. 4, 1944.

16 (U.S.N.M. 119576, 119578–79, 119581–85, 119589, 119782–86, 119790–91) Torokina Pt., Bougainville Id. (W. L. Necker).

A re-examination of collections reported by Barbour (1921) and Burt and Burt (1932) shows the difficulty of distinguishing the young of this small frog from the young of other Solomons ranids. Barbour (1921, p. 95) originally listed three specimens from New Georgia Island in the W. M. Mann collections. Five other specimens were erroneously identified as the young of *Cornufer guppyi* (M.C.Z. 7452 from Santa Ana Island, 7455 and 7457 from Malaita Island) and as the young of *Platymantis solomonis* (M.C.Z. 7489–90 from Malaita Island). Burt and Burt (1932, p. 489) similarly referred a small male (A.M.N.H. 35427 from Ronongo Island) to *Cornufer guppyi*. Mertens (1929, p. 266) has shown that specimens used by Sternfeld (1920 [1921], p. 435) as the basis for describing *Chaperina fredericii* and *Sphenophryne wolfi* actually were specimens of *Batrachylodes vertebralis* (see also Brown and Myers, 1949b, p. 379).

Description. Breadth of head slightly greater than its length or about equal to it; snout round-pointed, its length somewhat less than half the breadth of the head (43.79% ± 1.187 for 13 specimens from Bougainville), projecting beyond the lower jaw (the thickened, whitish tip mentioned by Barbour [1921, p. 95] appears in varying degree in both males and females); white nuptial tubercles present on

the ventral surface of the head region of males, varying greatly in frequency from a few near the tip of the lower jaw to a scattering over the entire under surface of the head and throat; nostril about equidistant from the tip of snout and eye; eye large, its diameter about 1/3 to 2/5 the breadth of the head (38.88% ± .596 for 13 specimens); loreal region nearly vertical, flat; canthus rostralis distinct, rounded; interorbital distance much greater than the breadth of the upper eyelid; tympanum covered by a thin skin, the diameter about 1/2 that of the eye (47.69% ± 2.091 for 13 specimens); vomerine teeth absent; tongue narrow-oval, posterior margin entire and free.

Forelimb well developed; fingers stout with large disks, which are broader than long and generally somewhat truncate; breadth of disk of third finger generally greater than diameter of tympanum, dorsal and ventral portions of the expanded disk are separated by a wholly inferior, crescentic groove, not continued across the lower surface at the proximal edge of the disk; inner metacarpal tubercle large, oval, moderately projecting; middle one low and broadly oval; two outer ones small and low; subarticular tubercles rather large, rounded; fingers without webs; hindlimb moderately developed, length of tibia about equal to, or 2/5 greater than, the breadth of the head, less than half the length from snout to vent (47.3% ± .876 for 13 specimens); tibiotarsal articulation reaching the tympanum or the eye; tips of toes with disks, but smaller than those of fingers, inferior and superior parts of disks separated in a manner similar to that of fingers; inner metatarsal tubercle rather strongly projecting, elliptical; outer low, rounded, smaller; subarticular tubercles, moderately large, rounded; skin of dorsum and lateral surfaces smooth or with a few short folds, particularly on the upper lateral surfaces; posterior surface of thighs usually with large, flat granules.

Color (in preservative) is highly variable and for that reason somewhat detailed color notes of three specimens, all from Torokina Point, Bougainville Island, follow:

U.S.N.M. 119578 almost uniformly grayish on the dorsum, upper lateral surfaces and limbs; a black bar extending on either side from near the tip of the snout across the loreal region to the eye and thence posteriorly to the region of the shoulder; ventral surfaces and margins of the lips whitish, the latter, as well as the limbs, head and throat regions, speckled with grayish-brown.

U.S.N.M. 119581 grayish on the dorsum and limbs, the latter with distinct, darker, transverse bars becoming narrower on the fingers and toes; irregular black flecks and spots on the dorsum and lateral surfaces; a white dorsolateral band from the posterior part of the upper eyelid to the groin; loreal regions, sides of head and margins of the

jaws grayish-brown, the latter indistinctly marked with narrow, white transverse bars; ventral surfaces white, heavily flecked with grayish-brown except on the abdomen.

U.S.N.M. 119786 grayish on the anterior part of the head; grayish-rose or red on the back, lateral surfaces and limbs, the latter with dark transverse bands; dorsum and lateral surfaces also heavily marked with black including an irregular transverse bar between the eyes and two somewhat indistinct anteriorly pointed chevrons on the back; sides of the head, loreal areas and mid-lateral regions are blackish, margins of lips lighter, the lower with rather distinct, narrow, white, transverse bars; ventral surfaces heavily flecked with brown.

Occasional specimens (as M.C.Z. 7455 and 7457) exhibit the light vertebral stripe emphasized by Boulenger in describing the type.

Measurements	♂ (U.S.N.M. 119578)	♀ (U.S.N.M. 119782)
Snout to vent	28.25 mm.	23 mm.
Snout length	5 "	3.25 "
Head length (to posterior edge of tympanum)	10 "	8 "
Head breadth	10.5 "	8 "
Eye diameter	4 "	3 "
Tympanum diameter	2 "	1.5 "
Tibia length	11.5 "	10.5 "

Range. (see distributional chart)

Genus CERATOBATRACHUS Boulenger

Boulenger (1884, p. 212) in describing this genus placed it in a distinct family on the basis of the toothed condition of the lower jaw and the undilated sacral diapophyses. Later (1910, pp. 149–156) he suppressed the family, noting that the tooth-like, bony projections of the lower jaw were less significant than once supposed in the Salientia. Noble (1931, p. 523) points out the close affinities of this genus with *Platymantis* from which it differs primarily in possessing odontoids and in the more extensive bony deposits in the squamosal and ethmoid regions of the skull. Only a single species is known. Boulenger (1886, pls. xii-xiii) gives fine illustrations of the variability in color pattern and the striking appearance of this frog.

The pupil is horizontal; vomerine teeth are present; omosternal style is forked at the base. Outer metatarsals are united, fingers and toes are without webs or nearly so. The terminal phalanges are bluntly rounded.

Ovarian eggs are large and unpigmented.

Ceratobatrachus guentheri Boulenger

(Pl. 2, fig. 5; Pl. 5, fig. 2)

Ceratobatrachus guentheri Boulenger, 1884, P.Z.S. London, 1884, p. 212: Treasury, Shortland and Fauro Ids. (Type in British Museum).

2 (M.C.Z. 2207; 2 cotypes) Fauro Id. (Exch. Brit. Mus.).
12 (" 7464, 7466–75, 7588) Malaita Id. (W. M. Mann) 1916.
3 (" 7476–78) Tulagi Id. (W. M. Mann) 1916.
4 (" 7479–82) Isabel Id. " 1916.
1 (" 26084) Stirling Id. (L. W. Jarcho) 1945.
2 (A.M.N.H. 5334–35) Malaita Id. (W. M. Mann) 1916.
1 (" 22858) Vangunu Id. (Whitney Exped.) 1928.
2 (" 22859–60) Rendova Id. " " 1928.
104 (" 34275–307, 35235–95, 35297–301, 35336–37) Bougainville Id. (Whitney Exped.).
1 (A.M.N.H. 35373) Shortland Id. (Whitney Exped.).
2 (" 35374, 35440) Mono Id. " "
4 (" 35381, 35399, 35431–32) Guadalcanal Id. (Whitney Exped.).
9 (A.M.N.H. 35384, 35400, 35413–18, 35422) Kolombangara Id. (Whitney Exped.).
4 (A.M.N.H. 34638, 35388, 35552, 35554) Choiseul Id. (Whitney Exped.).
5 (A.M.N.H. 35393–94, 35408–10) Russell Ids. (Whitney Exped.)
1 (" 35395) Narovo Id. " "
4 (" 35397–98, 35411–12) Florida Id. " "
6 (" 35402–03, 35419–20, 35428–30, 35433) Ronogo Id. (Whitney Exped.).
1 (A.M.N.H. 35426) Gizo Id. (Whitney Exped.).
2 (" 35434–35) Vella Lavella Id. " "
5 (" 36437–41) Auki, Malaita Id. " "
10 (" 39986–96) central Malaita Id. (Whitney Exped.) 1930.
3 (A.M.N.H. 51745; 2 uncat.) near Cape Hunter, Guadalcanal Id. (Whitney Exped.) 7/20/1927.
2 (A.M.N.H. 51952–53) Guadalcanal Id. 1945.
1 (U.S.N.M. 20066) Solomon Ids. (Edward Girard).
1 (" 61163) Malaita Id. (W. M. Mann) 1916.
2 (" 118254–55) Atta, Malaita Id. " 1916.
14 (" 119552–58, 119749–55) Torokina Pt., Bougainville Id. (W. L. Necker and D. H. Johnson).
3 (M.V.Z. 44193, 44224–25) lower Lunga River, Guadalcanal Id. (John Chattin) 7/11/1944.
1 (M.V.Z. 44947) Munda, New Georgia Id. (Chas. G. Sibley) 11/4/1944.
64 (C.A.S. 72101–64) Malaita Id. (Crocker Exped.).

2 (S.N.H.M. 8391–92) Torokina Pt., Bougainville Id. (J. P. Heath) 1943.
1 (S.N.H.M. 9337) Bougainville (Exch. American Museum Natural History) 1948.
1 (S.N.H.M. 9338) Malaita (Exch. American Museum Natural History) 1948.

Description. Head triangular in shape, broader than long (in young specimens about as broad as long), much depressed; breadth about ½ the length from snout to vent (52.28% ± .707 for 12 specimens from Bougainville); snout long, pointed; eye moderate, its diameter about 1/5 to 1/4 the breadth of the head (23.11% ± .574 for 12 specimens); tympanum large, oval, its vertical diameter much greater than its horizontal diameter, somewhat less than, or equal to, that of the eye; nostril much nearer the tip of snout than the eye; loreal region strongly oblique, slightly concave; canthus rostralis angular; vomerine teeth in two short, slightly oblique or transverse, widely separated patches behind the choanae or between their posterior edges; tongue oval with a broad or moderately narrow, shallow notch at the mid-point of the posterior free margin.

Forelimb well developed; fingers long, slender; tips bluntly rounded, or slightly swollen; subarticular tubercles large, generally as broad as the subtending digit, round to oval, generally more protrudent distally; inner metacarpal tubercle short, broadly oval, strongly protrudent; middle one more narrow, low, outer small and low; hindlimb moderate; length of tibia about 4/5 the breadth of the head (81.72% ± 1.08 for 12 specimens); tips depressed, moderately dilated into somewhat pointed disks, the inferior pad separated from the superior portion by a terminal, crescentic groove (except that the inner and outer toes, particularly the latter, may often show this groove indistinctly or not at all); subarticular tubercles smaller than those of fingers, round to oval, strongly protrudent, pointed distally; inner metatarsal tubercle moderate in length, elliptical, strongly protrudent; outer small and round; toes without webs; skin occasionally rather smooth with prominent, protrudent, triangular, dermal flaps only on the upper eyelids and tip of the snout, and narrow, irregular, dorsal folds scarcely evident; but generally with prominent dermal flaps also along the limbs and at the angles of the jaws and with narrow, elongate, irregular folds along the body above the dorsolateral region and along the lower limbs, and with a few short, transverse folds on the dorsum as well as the prominent ones across the interorbital and internasal spaces.

Color (in preservative) of the dorsum highly variable, light gray or tan, almost uniform or with some scattered darker spots; grayish

suffused with reddish or dusky; reddish-brown; or almost black. Thighs usually with narrow, transverse, dark bands; venter whitish, spotted with brown on head and throat, or heavily suffused with light-brown or sometimes blackish-brown.

Ovarian eggs are large and unpigmented. A juvenile (M.C.Z. 7588) measures only 10 mm. from snout to vent.

Measurements	♂ (U.S.N.M. 119553)	♀ (U.S.N.M. 119554)
Snout to vent	65 mm.	80 mm.
Snout length	13 "	15 "
Head length (to posterior edge of tympanum)	25 "	35 "
Head breadth	30 "	40 "
Eye diameter	8 "	9 "
Tympanum diameter	7 "	7 "
Tibia length	27 "	33 "

Range. (see distributional chart)

Genus CORNUFER Tschudi

Platymantis was re-separated from *Cornufer* by Boulenger (1918b, p. 372) and in keeping with this treatment of these two groups the latter may be defined as ranid frogs with broadly dilated finger tips, the disks of which are usually larger than those of the toes. There is generally a transverse proximal groove on the ventral surface (indistinct or lacking in some of the small Philippine species and perhaps in others) which is continuous laterally with the crescentic groove between the inferior and superior portions of the disk; the toes are moderately webbed or webbed only at the base; the terminal phalanx is a broad "T" with the horizontal expansion straight or somewhat curved. The omosternal style is broadly forked at the base. Fully developed ovarian and uterine eggs are large and unpigmented where known.

The two species known to occupy the Solomon Islands may be distinguished as follows:

Head narrow, its breadth generally less than 2/5 the length from snout to vent; loreal region slightly or moderately oblique; snout strongly protrudent, rather pointed; groove surrounding ventral pad of finger and toe disks wholly inferior ..... *neckeri*

Head broad, its breadth generally more than 2/5 the length from snout to vent; loreal region strongly oblique; snout not or little protrudent, round or round-pointed; groove surrounding ventral pad of finger and toe disks distally terminal or superior ..... *guppyi*

Cornufer guppyi Boulenger

(Pl. 2, fig. 3; Pl. 5, fig. 4)

Cornufer guppyi Boulenger, 1884, Proc. Zool. Soc. London, 1884, p. 211: Treasury Id. (Type in British Museum).
Cornufer dorsalis, Boulenger, 1887, p. 337.
Cornufer guppyi (part), Barbour, 1921, p. 97.
Cornufer guppyi (part), Burt and Burt, 1932, p. 489.

1 (M.C.Z. 7453) Isabel Id. (W. M. Mann) 1916.
1 (" 7456) Atta, Malaita Id. " "
4 (" 7458–59, 7461–62) Auki, Malaita Id. " "
12 (A.M.N.H. 34267, 34271, 34308, 34310, 35313, 35318–19, 35338, 35349–52) Bougainville Id. (Whitney Exped.).
1 (A.M.N.H. 34635) Choiseul Id. (Whitney Exped.).
1 (" 35370, 35390, 35424) Mono Id. " "
1 (" 35380) Guadalcanal Id. " "
1 (" 35385) Arnavon Id. " "
2 (" 39999–40000) Malaita Id. " "
1 (S.N.H.M. 9339) Bougainville Id. (Exch. Amer. Mus.) 1948.
1 (C.A.S. 54721) Auki, Malaita Id. (Exch. Mus. Comp. Zool.) 1921.
1 (" 72165) Malaita Id. (Crocker Exped.) 1933.

In his original description Boulenger did not state what he believed to be the relationship of this species to other members of the genus. Later, however, (1886, p. 54) he related it to *C. dorsalis* (= *vitiensis*) from the Fiji Islands, distinguished on the basis of its relatively broader, depressed head and the larger disks of the fingers and toes. The close affinities of these two species are evident but the fact that they may also be distinguished on the basis of structural characters of the finger disks has been shown by Brown and Myers (1949a, pp. 4–7). *C. guppyi* is also a much larger species, for female specimens up to 60 mm. from snout to vent do not show evidence of maturity whereas a 45 mm. specimen of *C. vitiensis* from Viti Levu Island is gravid.

Description. Head broad and much depressed, more prominently so in older and larger specimens, its breadth greater than its length and generally more than 2/5 the length from snout to vent (43.10% ± 1.234 for 5 specimens from Malaita Island); snout rounded, scarcely protrudent beyond the lower jaw, its length 1 1/3 to 1 2/3 the diameter of the eye; eye moderate, its diameter 1/5 to 3/10 the breadth of the head (27.38% ± 1.574 for 5 specimens); tympanum round, its diameter about 1/2 that of the eye and about 1/6 the breadth of the head (14.94% ± 1.118 for 5 specimens); canthus rostralis rounded; loreal region strongly oblique, concave; nostril nearer tip of snout than eye; vomerine teeth in two small to moderate, transverse or some-

what oblique patches, between or behind the posterior edges of the choanae, generally separated by more than the length of one of them; tongue broadly obovate with a rather deep notch at the mid-point of the posterior free margin.

Forelimb well developed, first finger shorter than the second; tips of fingers dilated into large disks, broader than long, the inferior pad separated from the superior portion of the disk by a dorsally subterminal, crescentic groove which is continuous laterally with the transverse groove across the ventral surface proximally; a prominent, distally-pointing, groove on the dorsal surface near the middle of the expanded portion; subarticular tubercles large, round or somewhat truncate proximally, generally as broad as the subtending digit, only slightly or moderately protrudent, inner metacarpal tubercle large, broadly elliptical or oval, its length equal to its distance from the distal end of the large tubercle of the first finger, middle one narrower, outer small, oval or elliptical or may be indistinct; hindlimb well developed, length of tibia slightly more or less than 1/2 the length from snout to vent (50.37% ± .604 for 5 specimens); tips of toes with large disks, slightly smaller than those of fingers, broader than long and with ventral pad completely surrounded by a groove as on the fingers; subarticular tubercles moderate to large, round to oval, often somewhat truncate distally, moderately protrudent; inner metatarsal tubercle moderately wide, elliptical, its length greater than its distance from the distal end of the tubercle of the first toe; outer small or moderate, round to oval, sometimes poorly defined; metatarsal area somewhat granulate; toes with moderate webs, reaching distally to the subarticular tubercle on the outside of the second toe, and to the subarticular tubercle on the outside of the third toe, dorsum almost smooth, upper lateral surfaces finely granulate or tuberculate; venter posterior to the pectoral region with moderate flat granules; posterior surface of thighs more finely granulate.

Color (in preservative) of dorsum and upper lateral surfaces highly variable, light tan almost white, grayish or dark reddish-brown, variously blotched or marbled with darker brown to blackish-brown, occasionally with a narrow white middorsal line; margin of lips more or less the same color as the dorsum; hindlimbs and frequently the forelimbs also with narrow to moderate dark transverse bars; venter whitish or light tan often blotched or speckled with brown anterior to the pectoral region.

Ovarian eggs large and unpigmented.

Measurements	♂ (M.C.Z. 7456)	♀ (M.C.Z. 7462)
Snout to vent	33 mm.	98 mm.
Snout length	6 "	16 "
Head length (to posterior edge of tympanum)	13 "	35 "
Head breadth	15 "	47 "
Eye diameter	4.5 "	10.5 "
Tympanum diameter	2 "	5 "
Tibia length	17 "	47 "

Range. (see distributional chart)

Cornufer neckeri Brown and Myers

Cornufer guppyi (part), Burt and Burt, 1932, p. 489.

Cornufer neckeri Brown and Myers, 1949a, Amer. Mus. Nov., no. 1418: Bougainville Id. (Type in American Museum of Natural History).

21 (A.M.N.H. 34268, 34270, 34309, 34311–19, 34322–23, 34329 holotype, 34525, 35331–35) Bougainville Id. (Whitney Exped.).

1 (S.N.H.M. 9335) Bougainville Id. (Exch. Amer. Mus.) 1948.

The *Rhacophorus*-like appearance of this frog, particularly in relation to the digital expansions, is striking. However, the intercalary cartilage is not present and this is the principal character upon which the rhacophorid and ranid frogs are separated.

Since this species was described (Brown and Myers, 1949a) no additional specimens have been found in collections examined and only a brief restatement of the original description can be given at this time.

Description. Head about as broad as long, its breadth generally less than 2/5 the length from snout to vent (38.88% ± .388 for 6 specimens from Bougainville); snout rather pointed, generally projecting well beyond the lower jaw, its length about 1 1/4 to 1 1/3 times the diameter of the eye; eye large, its diameter about 1/3 to 2/5 the breadth of the head (36.95% ± 1.785 for 6 specimens); canthus rostralis rather sharp; loreal region slightly oblique, concave; tympanum round, its diameter generally less than 1/2 that of the eye and about 1/6 the breadth of the head (16.52% ± .64 for 6 specimens); vomerine teeth in two oblique, well separated patches behind the level of the choanae; tongue oval with a broad, shallow notch in the free posterior border.

Forelimb well developed; tips of fingers broadly dilated (except for the inner one); the inferior pad transversely elliptical, completely surrounded by a groove which distally is inferiorly subterminal; breadth of disk of third finger generally greater than the diameter of

the tympanum; subarticular tubercles (except for the basal ones which are small, round and low) large, round to oval, strongly protrudent distally; inner metacarpal tubercle prominent, nearly twice as long as broad; middle one broadly oval, large; outer small, narrow, elliptical; hindlimb moderately long, length of tibia about 1/2 the length of the body (49.64% ± .747 for 6 specimens); tips of toes broadly expanded, but dilations smaller than those of fingers, ventral pads of disks transversely elliptical and completely surrounded by a groove similar to that of the fingers; toes webbed to the basal tubercle or slightly beyond; subarticular tubercles moderate, round to oval, most strongly projecting distally; inner metatarsal tubercle prominent, elliptical, 2 to 3 times as long as broad; outer distinct, smaller, round to oval; skin of the dorsum generally smooth or with a few small tubercles posteriorly; venter finely granulate posterior to the pectoral region as is also the proximal posterior surface of the thighs.

Color (in preservative) of the dorsum varies from grayish to dark-reddish, more or less uniform or with lighter and darker blotches. The upper surface of the thighs have more or less broad, narrowly separated, diagonally transverse bands. The venter is light grayish to tan, profusely flecked and spotted, especially anteriorly and on limbs.

Measurements	♂ (S.N.H.M. 9336)	♀ (A.M.N.H. 34325)
Snout to vent	48 mm.	56 mm.
Snout length	8.5 "	9 "
Head length (to posterior edge of tympanum)	17 "	20 "
Head breadth	18 "	22 "
Eye diameter	6.5 "	7 "
Tympanum diameter	3 "	4 "
Tibia length	24 "	27 "

Range. Known from Bougainville Island.

Genus DISCODELES Boulenger

Boulenger (1918a, p. 238) set up *Discodeles* as a subgenus of *Rana* to include *guppyi* (the type), *opisthodon* and *bufoniformis*, and revived, as a subgenus, *Hylarana* Tschudi to include *Rana kreffti* and four New Guinea species. In 1920 he gave a much more detailed account of the differences between these two groups. *Discodeles* was stated to have the omosternum forked at the base, outer metatarsals separated by a web only in the distal third, nasal bones large, in contact with each other and with the frontoparietals. It should also be noted that the

terminal phalanx is bluntly rounded; the fingers free; and the toes moderately to almost fully webbed. To *Discodeles,* Boulenger also assigned six Indian and Malayan species and to *Hylarana* he added fifty-eight south Asiatic and one African species. He regarded *Discodeles* as leading to *Platymantis* and *Cornufer.*

Noble (1931, pp. 520–523) raised *Discodeles* to generic rank and regarded it as closely related to *Platymantis.* He also limited *Discodeles* in known range to the Solomon and Fiji Islands.[1] Although he did not state his reasons at this point he implied that all species of *Discodeles* probably practice direct development and this would of course eliminate the Asiatic frogs referred to this subgenus by Boulenger. Since this is probably a sound basis for limiting the natural group comprising *Discodeles,* following Noble I regard it as a genus distinct from *Rana.*

Three species of the genus are here recognized from the Solomons. Barbour's placing of *D. opisthodon* in the synonymy of *D. bufoniformis* (1921, p. 98) was an error as suspected by Schmidt (1932, p. 181). Van Kampen (1923, p. 186) actually retained *D. opisthodon* as a distinct species though expressing some doubt. The shorter legs and more toad-like form of adults, especially females, of *D. bufoniformis* as compared to *D. opisthodon* can be readily shown in the ratios: (1) width of head/length of tibia, (2) length of tibia/length from snout to vent. The tips of the toes are generally less expanded, more oval and pointed, for *D. bufoniformis*; the tips of the fingers less depressed and less dilated. Although the males and juveniles of *D. bufoniformis* cannot be readily distinguished from those of *D. opisthodon* on the basis of the above mentioned ratios, they generally can be rather easily separated on the basis of the pointed or simply swollen finger tips which lack entirely a terminal crescentic groove between the inferior and superior portions which is usually present for males and juveniles of *D. opisthodon.*

Discodeles bufoniformis is referred to in the binomial, for Hediger's (1934, p. 484) description of *D. bufoniformis cognatus* from Movehafen, New Britain, was, I believe, in error as to the closest affinities. *D. bufoniformis cognatus* was said to differ from *D. bufoniformis* in the smoother skin and the more strongly developed inner metatarsal tubercle, and from *D. ventricosus* (Vogt, 1912, p. 8) from the Admiralties on the basis of the greater length of the first finger, the greater length of the hindlimb and the more fully webbed toes. Although Hediger does not give measurements of the breadth of the head and the length of the tibia for his type and unique specimen, Vogt's

[1] Noble's reference to the Fijis may have been a lapsus for Admiralty Islands since no member of *Discodeles* has ever been recorded for the Fijis as far as I can determine. Vogt (1912, p. 8) described *Discodeles ventricosus* from the Admiralty Islands.

measurements for *D. ventricosus* correspond to those of *D. opisthodon*. This suggests that *D. bufoniformis cognatus* is probably related to *D. opisthodon* or *D. guppyi* and should be re-examined in this light.

The following key serves to distinguish the species of *Discodeles* known from the Solomon Islands.

1. Tips of fingers rather broadly dilated and depressed forming prominent disks; lower metatarsal surface smooth; vomerine tooth patches extending outward beyond the sagittal plane of the inner edge of the choanae; males with external vocal sacs; tibia very long, 1¼to 1½ times the breadth of the head at the angle of the jaws ..... *guppyi*

   Tips of fingers not, or but moderately, dilated and depressed; lower metatarsal surface with numerous tubercles; vomerine tooth patches not extending outward beyond the sagittal plane of the inner edge of the choanae; males with internal vocal sacs 2

2. Disks of toes generally oval, moderately pointed, only occasionally round; tips of fingers pointed or bluntly swollen (not dilated or depressed); length of tibia less than, or equal to, breadth of head (about 4/5 to 9/10 for adult females) ..... *bufoniformis*

   Disks of toes rather broad, round; tips of fingers generally somewhat dilated and depressed, a more or less distinct terminal, crescentic groove separating the dorsal and ventral portions; length of tibia about equal to breadth of head (slightly greater for adult females) ..... *opisthodon*

Discodeles bufoniformis (Boulenger)

(Pl. 1, fig. 2; Pl. 2, fig. 4; Pl. 7, fig. 3)

Rana bufoniformis Boulenger, 1884, Proc. Zool. Soc. London, 1884, p. 210 Treasury Id. (Type in British Museum).
Rana (*Discodeles*) *bufoniformis*, Boulenger, 1918a, pp. 237–40.
Rana bufoniformis (part), Barbour, 1921, pp. 98–99.
Discodeles bufoniformis, Noble, 1931, p. 523.
Rana bufoniformis (part), Burt and Burt, 1932, pp. 489–90.
Rana kreffti (part), Burt and Burt, 1932, p. 490.

1 (M.C.Z. 7413) Auki, Malaita Id. (W. M. Mann) 1916.
4 (" 7414–17) Isabel Id. " "
2 (" 7428–29) Tulagi Id. " "
7 (A.M.N.H. 35375, 35377–79, 35392, 35441–42) Mono Id. (Whitney Exped.).
6 (A.M.N.H. 35443–48) Choiseul Id. (Whitney Exped.).
21 (" 35450–70) Ronongo Id. " "
2 (" 35437–38) Vella Lavella Id. " "
1 (S.N.H.M. 9342) Ronongo Id. (Exch. Amer. Mus.) 1916.
1 (" 9343) Choiseul Id.
22 (U.S.N.M. 119595–610, 119766–71) Torokina Pt., Bougainville Id. (W. L. Necker and D. H. Johnson).

Boulenger (1920, p. 110) had still seen only two adult specimens of *D. bufoniformis,* the type from Treasury (Mono) Island and one from Fauro Island, when he reviewed the Ranas of the western Pacific regions.

Island (geographical) races of this species are indicated in some characters but it seems unwise to attempt to delimit races until such time as more specimens are available from many of the islands. I have seen a series of more than six adult specimens from only two islands, Bougainville and Ronongo.

Description. Head broad, depressed, its breadth for mature specimens about 2/5 to 1/2 the length from snout to vent (46.32% ± 1.35 for 22 specimens from Ronongo); snout broadly rounded (pointed only in young individuals); eye large, its diameter about equal to the length of the snout, 1/4 to almost 1/3 the breadth of the head (25.5% ± .311 for 22 specimens); tympanum round, its diameter 2/5 to 1/2 that of the eye (43.45% ± .597 for 22 specimens); interorbital space as broad or broader than the upper eyelid; loreal region strongly oblique, concave; canthus rostralis rounded; vomerine teeth in two oblique patches, generally separated by a distance equal to the length of one of them, posterior to the choanae and not extending out on either side to the sagittal plane of the inner border of the choanae; tongue broadly oval with a moderate to broad notch at the mid-point of the free posterior margin; vocal sacs internal.

Forelimb well developed; tips of fingers pointed in young, bluntly rounded or more often swollen in adults, not depressed; first finger longer than second; subarticular tubercles large, rounded or slightly pointed distally; inner metacarpal tubercle large, broadly elliptical or oval; middle and outer ones more or less distinct, somewhat shorter than the inner one and generally merging proximally; fingers without webs; hindlimb moderately developed, length of tibia much less than breadth of head for adult females (88.72% ± .482 for 22 specimens), slightly less than, or equal to, breadth of head for males and juveniles; tips of toes depressed, with slightly or moderately expanded disks, generally somewhat pointed, the inferior pad being separated from the superior part by a crescentic, distally subterminal groove; subarticular tubercles moderately large, oval, more pointed distally; lower surface of the metatarsal region with numerous small tubercles; inner metatarsal tubercle elongate, elliptical, prominent; outer small, round; webs generally reaching the disks of the first and fifth toes, the distal tubercle on the outer side and the penultimate tubercle on the inner side of the fourth; skin of the dorsum and limbs strongly rugose with numerous small to large porous warts, more or less in elongate folds on the upper lateral surfaces; upper surface of the head (except the

eyelids) rather smooth; venter and lower surface of the thighs generally granulate.

Color (in preservative) of the dorsum grayish-brown, to light-brown or dark reddish-brown; ventral surfaces whitish or yellowish, more or less powdered with grayish-brown or light-brown.

Uterine eggs are large and unpigmented, measuring 7 mm. in diameter (65% alcohol preservation) as observed in U.S.N.M. 119770 from Bougainville.

Measurements	♂ (U.S.N.M. 119595)	♀ (U.S.N.M. 119770)
Snout to vent	78.5 mm.	134 mm.
Snout length	11.5 "	22 "
Head length (to posterior edge of tympanum)	24 "	46 "
Head breadth	34 "	58 "
Eye diameter	11 "	17.5 "
Tympanum diameter	4.25 "	6.5 "
Tibia length	32 "	49 "

Range. (See distributional chart).

Variation. The entire series (U.S.N.M. 119595–610, 119766–71) from Torokina Point, Bougainville Island, exhibit a smoother dorsum and a generally lighter coloration of the venter than the series (A.M.N.H. 35450–70) from Ronongo Island in the New Georgia group. However, on comparison of the two topotypes, A.M.N.H. 35442 is found to be much more warty than A.M.N.H. 35441. The series of specimens (A.M.N.H. 35443–48) from Choiseul possess somewhat more broadly expanded disks at the tips of the toes, but otherwise show no differences. Parker (1939, p. 2) has called attention to the much larger size of the adult females as compared to the adult males. The probability (P) that the dimorphism, exhibited by the present series of four mature females and three mature males from Bougainville Island, is a result of chance sampling is extremely low as shown by the "t" value for the difference between the means. In the following table n = degrees of freedom.

	Male	Female	diff.	t	n	P
Mean of snout to vent length	($N_1 = 3$) 76.17 mm. ±1.30	($N_2 = 4$) 129 mm. ±3.24	52.83	13.21	5	$< .001$

Discodeles guppyi (Boulenger)

Rana guppyi Boulenger, 1884, Proc. Zool. Soc. London, 1884, p. 211: Shortland Island. (Type in British Museum).

Rana (*Discodeles*) *guppyi* Boulenger, 1918a, pp. 239–40.
Discodeles spp., Noble, 1931, p. 523.
Rana bufoniformis (part), Burt and Burt, 1932, pp. 489–90.
Rana guppyi (part), Burt and Burt, 1932, p. 490.
Rana krefftii (part), Burt and Burt, 1932, p. 490.

1 (M.C.Z. 3503) Guadalcanal Id. (Exch. Brit. Mus.) 1914.
3 (" 7548–50) Malaita Id. (W. M. Mann) 1916.
1 (" 22309) Guadalcanal Id. (Exch. Brit. Mus.) 1916.
1 (" 26054) Guadalcanal Id. (L. W. Jarcho) 1944.
2 (A.M.N.H. 22853–54) Rendova Id. (Whitney Exped.)
1 (" 22855) Gatukai Id. " "
3 (" 34326, 34330–31) Bougainville Id. " "
1 (C.A.S. 49964) Guadalcanal Id. (J. A. Kuche) 1921.
19 (" 72081–99) Malaita Id. (Crocker Exped.) 1933.
1 (U.S.N.M. 63400) Malaita Id. (W. M. Mann) 1916.
2 (" 119772–73) Torokina, Bougainville Id. (W. L. Necker)
1 (S.N.H.M. 9344) Bougainville Id. (Exch. Amer. Mus.) 1948.

Rana guppyi was described by Boulenger (1884, p. 211) on the basis of a single female specimen from Shortland Island. Later (1920, p. 214) he recorded specimens from islands as far south as Isabel and Guadalcanal. At this time he gave a more complete description and called attention to certain characters, as the relatively much greater length of the hindlimbs, which some later workers have failed to use.

Thus Burt and Burt (1932, p. 490) erroneously placed specimens from Gatukai and Rendova Islands, which belong to this species, under *R. bufoniformis,* basing their assignment on the wartiness of the skin of the dorsum and granulation of the venter and thighs. These three specimens from Rendova and Gatukai are darker reddish-brown ventrally, more granulate on thighs and venter, and with more numerous fine warts on the dorsum than are the other specimens examined. Should such differences remain constant for specimens from the New Georgia group of islands, they might well constitute a valid race of *D. guppyi,* but they are, regardless of the warty nature of the skin, wholly unlike *D. bufoniformis* or *D. opisthodon.*

Description. A very large frog, reaching a length from snout to vent of at least 195 mm. (M.C.Z. 26054); head broader than long, its breadth about 2/5 the length from snout to vent (39.34% ± .278 for 19 specimens from Malaita); snout rounded to somewhat pointed, little or moderately protrudent beyond the lower jaw, long, its length somewhat less than or equal to 1/2 the breadth of the head; nostril about twice as far from the eye as the tip of the snout; eye moderate, its diameter 1/4 or somewhat greater than 1/4 the breadth of the head (27.32% ± .36 for 19 specimens); tympanum round, its diameter about 1/3 to nearly 1/2 that of the eye (41.09% ± .929 for 19 speci-

mens); loreal region moderately oblique; canthus rostralis distinct; vomerine teeth in two transverse or slightly oblique patches, behind or with their bases between the choanae, their crests straight or curved and extending laterally beyond the sagittal plane of the inner borders of the choanae, the patches separated by a distance not more than twice the length of either series; tongue oval in shape, free posteriorly, with a moderate to deep, rather narrow notch at the mid-point of the posterior margin; vocal sacs external.

Forelimb well developed; fingers with strongly depressed, expanded disks at the tips, the inferior pad separated from the superior portion by a deep, crescentic, terminal or dorsally subterminal groove; subarticular tubercles large, round or broadly oval, inner metacarpal tubercle large, broadly elliptical, its length equal to its distance from the distal end of the subarticular tubercle of the inner finger; the middle and outer smaller and broadly oval; hindlimb long, length of the tibia 1¼ to 1½ times the breadth of the head; tips of toes with broad, strongly depressed disks, the inferior pad separated from the superior portion by a crescentic groove as on the fingers; subarticular tubercles moderate in size, oval and more strongly protrudent distally; metatarsal region smooth; inner metatarsal tubercle narrow-elongate; outer small and round; dorsum generally rather smooth except along the dorsolateral regions, or with small to moderate tubercles over the entire dorsal surfaces (as in A.M.N.H. 22855); posterior venter and posterior surface of the thighs of many specimens covered with moderate, flat granules, or nearly smooth.

Color of the dorsum (in preservative) varies from light reddish-brown to dark reddish-brown or blackish-brown, more or less uniform or with darker blotches. The limbs may be somewhat lighter. The venter is usually yellowish or whitish with grayish-brown or brownish suffusion of the chin and throat; or more uniformly reddish-brown (as in A.M.N.H. 22855). The margins of the lips may be uniformly light or may show broad, dark transverse bars (as in S.N.H.M. 9344).

Ovarian eggs are large and unpigmented.

Measurements	♂(A.M.N.H. 22855)	♀(C.A.S. 72094)
Snout to vent	128 mm.	170 mm.
Snout length	23 "	29 "
Head length (to posterior edge of tympanum)	42.5 "	51 "
Head breadth	51 "	64 "
Eye diameter	14 "	16 "
Tympanum diameter	5 "	7 "
Tibia length	64 "	86 "

Range. (See distributional chart).

Discodeles opisthodon (Boulenger)

(Pl. 7, figs. 1, 2)

Rana opisthodon Boulenger, 1884, Proc. Zool. Soc. London, 1884, p. 211: Treasury and Fauro Ids. (Types in British Museum).
Rana bufoniformis (part), Barbour, 1921, p. 98.
Discodeles opisthodon, Noble, 1931, pp. 64, 523.
Rana bufoniformis (part), Burt and Burt, 1932, pp. 489–90.
Rana guppyi (part), Burt and Burt, 1932, p. 490.
Rana bufoniformis Slevin, 1934, p. 184.
Rana opisthodon, Boulenger, 1918a, p. 238.

1 (M.C.Z. 3591) Solomon Ids. (Exch. Australian Mus.) 1914.
6 (" 7408,[1] 7423–27) San Cristobal Id. (W. M. Mann) 1916.
4 (" 7409–12) Ugi Id. (may be San Cristobal). (W. M. Mann) 1916.
1 (M.C.Z. 7431) Santa Ana Id. (W. M. Mann) 1916.
1 (" 22310) Solomon Ids. (Exch. Brit. Mus.).
1 (A.M.N.H. 35436) Fauro Id. (Whitney Exped.).
7 (" 34274, 34327–28, 35354, 35356–58) Bougainville Id. (Whitney Exped.).
1 (A.M.N.H. 35421) Kolombangara Id. (Whitney Exped.).
1 (U.S.N.M. 63401) Ugi Id. (W. M. Mann) 1916.
1 (C.A.S. 72247) Ugi Id. (Crocker Exped.) 1933.
1 (S.N.H.M. 9345) Bougainville Id. (Exch. Amer. Mus.) 1948.

Description. Head broader than long; its breadth usually less than 1/2 the length from snout to vent (43.92% ± .58 for 5 specimens from Bougainville and Fauro Islands); snout generally somewhat pointed; nostril nearer tip of snout than eye; eye moderate, its diameter about 3/5 to 4/5 the length of the snout, 1/4 to occasionally 1/3 the breadth of the head (30.62% ± 1.103 for 8 specimens); tympanum round, its diameter about 1/3 to 1/2 that of the eye (39.06% ± 1.308 for 8 specimens); loreal region oblique, moderately concave; canthus rostralis distinct, somewhat angular; vomerine teeth in two oblique patches behind the choanae or with the anterior portion of their bases between the choanae, not extending out beyond the sagittal plane of the inner edges of the choanae, patches separated by a distance generally equal to or greater than the length of either of them; tongue broadly oval, free posteriorly, with a narrow to broad, rounded notch at the mid-point of the posterior margin; vocal sacs internal.

Forelimb well developed; tips of fingers depressed, moderately dilated, the inferior pad separated from the superior part by a more or less distinct, crescentic, terminal groove, especially in males and

[1] M.C.Z. 7408 is recorded from Ugi Id. However, a note inserted in the body cavity at the time it was collected gives the station as Pamua which is on San Cristobal.

juveniles; subarticular tubercles large, round to somewhat oval; palmar area finely tuberculate; inner metacarpal tubercle broadly elliptical, outer one about equal to it in length but narrower, middle one shorter broadly oval; fingers without webs; hindlimb well developed, the length of the tibia about equal to the breadth of the head (98.62% ± 1.676 for 8 specimens, 101.95% ± 3.69 for 3 large females); tips of toes strongly depressed and dilated, the inferior pad somewhat pointed distally and separated from the superior portion by a crescentic, dorsally subterminal groove; subarticular tubercles generally oval, more protrudent distally; metatarsal area covered with small tubercles; inner metatarsal tubercle elongate-elliptical, its length equal to or greater than its distance from the distal end of the subarticular tubercle of the inner toe; the outer moderate, round; toes generally webbed to the disk on the first and fifth and almost to the distal tubercle on the inside of the fourth; dorsum with small to moderate porous warts and tubercles, generally more numerous and larger posteriorly and on the hindlimbs, frequently in somewhat elongate folds on the upper lateral surfaces; posterior venter and lower surface of the thighs granulate.

Color of the dorsum (in preservative) light-brown to dark reddish-brown, generally with lighter blotches anteriorly and often with small blackish, scattered blotches, and with narrow, dark, transverse bars on the hindlimbs; venter whitish to light-brown, diffused or marbled with darker brown on the head and pectoral areas.

Ovarian eggs are large and unpigmented.

Measurements	♂ (M.C.Z. 7412)	♀ (A.M.N.H. 35436)
Snout to vent	103 mm.	147 mm.
Snout length	17.5 "	25 "
Head length (to posterior edge of tympanum)	35 "	48 "
Head breadth	46 "	66 "
Eye diameter	11 "	16 "
Tympanum diameter	6 "	7 "
Tibia length	48 "	68 "

Range. (See distributional chart).

A single male specimen (A.M.N.H. 35421) from Kolombangara is generally smoother on the dorsum, has the webs of the toes much reduced (about 1/3 instead of 2/3 webbed) and has a larger tympanum in relation to the eye. This may represent a geographic race occupying this island or perhaps the New Georgia group if additional material shows these differences to be consistent.

Genus Palmatorappia Ahl

Ahl (1927, p. 113) set up this genus based on a re-examination of the type and paratypes of Sternfeld's *Hylella solomonis* which he found to belong to the Ranidae rather than the Hylidae. He at that time considered it to be near to *Hyperolius* (*Rappia* of authors). Noble (1931, p. 524) would derive *Palmatorappia* from *Cornufer* or an allied genus, stating that the omosternum is forked at the base. An examination of one of Sternfeld's paratypes (Senckenberg Museum, No. 6602) shows this to be true, and Ahl's statement (1927, p. 113), "*Omosternum mit knöchernem, ungegabelten Stiel*", is in error. As pointed out by Mertens (1929, p. 268) Kinghorn's (1928, p. 130) description of *Hypsirana*, based upon specimens of this Solomons frog, was published without knowledge of Ahl's or Sternfeld's earlier work.

The pupil is horizontal; vomerine teeth are absent; fingers and toes are almost fully webbed. In the only known species the tips of the fingers and toes are dilated into large, somewhat truncate disks. The inferior pad of the disk is separated from the superior portion by a crescentic groove which joins laterally with a ventral transverse groove forming the proximal boundary of the pad as in most species of *Cornufer*. The outer metatarsals are separated by a groove (not united as stated by Ahl, 1927, p. 113); the omosternal style is forked at the base; the terminal phalanx is T-shaped.

Palmatorappia solomonis (Sternfeld)

(Pl. 1, fig. 5; Pl. 5, fig. 3)

Hylella solomonis Sternfeld, 1920 (1921), Abhand. Senckenberg. Natur. Ges., 36, p. 436, Pl. xxxi, fig. 10: Buka Id. (Type in Senckenberg Museum).
Palmatorappia solomonis, Ahl, 1927, Sitz. Ges. Natur. Fr. Berlin, p. 114.
Hypsirana heffernani, Kinghorn, 1928, Rec. Austral. Mus. 16, p. 130, fig. 7: Tunabuli, Isabel Id. (Type in Australian Museum).

Description. Head broad, its breadth equal to or greater than its length, about 2/5 the length from snout to vent, 3/4 to 4/5 the length of the tibia; snout round, scarcely projecting beyond the lower jaw; eye large, its diameter more than 1/3 the breadth of the head; tympanum indistinct, round, its diameter about 1/2 that of the eye; interorbital space broader than the upper eyelid; loreal region nearly vertical, concave; canthus rostralis rounded; vomerine teeth absent; tongue small, oval with a shallow notch at the mid-point of the posterior free margin.

Forelimb well developed; fingers strongly depressed, first shorter than the second; tips dilated into large, distally rather truncate disks,

the inferior pad of which is separated from the superior portion by a crescentic groove which is continuous laterally with a transverse groove across the ventral surface forming the proximal border of the disk as in *Cornufer*; pad transversely elliptical, disks scarcely broader than the subtending digit which is bordered laterally by a wide dermal flange as in *Hyla lutea*; subarticular tubercles very small, round or oval, scarcely protrudent; inner metacarpal tubercle small, elliptical, rather indistinct; outer large, round, indistinct; fingers webbed to the distal tubercle or nearly to the disk except for the third; hindlimb well developed; length of tibia half or more than half the length from snout to vent; toes depressed; tips dilated into large disks with inferior transversely elliptical pads limited as on the fingers; disks about the same size as those of the fingers, scarcely broader than the subtending digit which is bordered laterally by a wide dermal flange; subarticular tubercles small, oval, little protrudent; inner metatarsal tubercle broadly elliptical, rather indistinct, outer absent; toes webbed to the distal tubercle or nearly to the disk except the fourth and on the inner side of the third; dorsum on upper lateral surfaces smooth but with numerous small, round, rather colorless, depressed areas; lower lateral surfaces, venter posterior to the pectoral region and inferior surfaces of the thighs with large flat granules.

Color (in preservative) of the dorsum, as described by Kinghorn, is at first purplish-brown, gradually fading to yellowish, or greenish-olive. The venter is yellowish.

Small ovarian eggs are unpigmented.

Measurements	(Senckenberg Museum 6602)
Snout to vent	28 mm.
Snout length	4 "
Head length (to posterior edge of tympanum)	10 "
Head breadth	11 "
Eye diameter	4 "
Tympanum diameter	2 "
Tibia length	15 "

Range. Known from Buka and Isabel Islands.

Genus PLATYMANTIS Günther

In general agreement with Boulenger (1918b, p. 372) and Deckert (1938, p. 148) the genus *Platymantis* may be defined as follows: ranids possessing small or moderate disks on the tips of the toes and fingers (or tips of fingers may be simply swollen in some species, as *P. solomonis* for example); a distinct ventral pad present on the disks of the toes,

often also of the fingers, separated from the dorsal part by a crescentic groove on the distal and lateral margins; toes free or occasionally with basal webs; terminal phalanx bluntly rounded; outer metatarsals united; omosternal style broadly forked at the base. Fully developed eggs are large and unpigmented for all species where such uterine or ovarian eggs are known.

The following key applies to the species known from the Solomon Islands:

1. First and second fingers of about equal length or first but slightly longer . . 2
   First finger much longer than second 3
2. Tips of fingers dilated into moderate, depressed disks with ventral pad separated from the dorsal part by a deep crescentic groove . . . . . *myersi*
   Tips of fingers undilated, pointed, without a groove separating the ventral from the dorsal portions . . . . . *aculeodactylus sp. nov.*
3. Tips of fingers slightly dilated and depressed with dorsal and ventral parts separated by a short, terminal crescentic groove (most prominent in males); dorsum rugose with folds moderately long and narrow; length of tibia generally greater than one-half the length from snout to vent . . . . . *papuensis weberi*
   Tips of fingers simply swollen without a groove separating ventral and dorsal portions; dorsum nearly smooth or moderately rugose with short relatively wide folds; length of tibia generally less than one-half the length from snout to vent . . . . . *solomonis*

Platymantis aculeodactylus sp. nov.

(Pl. 5, fig. 1)

Two specimens from Torokina area, Bougainville Island, which were collected by W. L. Necker and D. H. Johnson in 1944–45, represent a very diminutive and until now undescribed species of this genus. A 25 mm. female is mature, whereas females of the other species of *Platymantis* known from the Solomons do not become mature until they have reached a length of 50 to 60 mm. or more.

Type. Mature female (U.S.N.M. 119769).

Paratype. Juvenile (U.S.N.M. 119580).

(?)1 (A.M.N.H. 34733) Choiseul. (Whitney Exped.).

Definition. A very small *Platymantis* (the type measuring 25 mm. from snout to vent, possesses well developed oviducts and moderate sized, unpigmented, ovarian eggs) having a rather smooth skin; undilated, somewhat pointed finger tips; very large, nearly transverse vomerine tooth patches posterior to the choanae; tongue feebly indented at the mid-point of the posterior free margin. This species is apparently most closely related to *P. cheesmanae* Parker (1940, p. 257)

from which it differs in the much larger vomerine tooth patches; greater length of the first finger, as long or longer than the second (not shorter); the greater breadth of the interorbital space, broader than the upper eyelid (not narrower).

Description of the type. Head moderately broad, about 2/5 the length from snout to vent and 4/5 the length of the tibia; snout rounded, its length about equal to the diameter of the eye; nostril nearer the tip of snout than eye; eye large, its diameter 1/3 or more the breadth of the head; interorbital space broader than the upper eyelid, less than the distance between the external nares; tympanum round, its diameter about 1/5 the breadth of the head; supratympanic fold moderate; canthus rostralis rounded; loreal region moderately oblique and concave; tongue broadly oval with a wide, shallow groove at the midpoint of the posteriorly free margin; vomerine teeth in two large, nearly transverse patches behind the levels of the choanae, extending outward beyond the sagittal plane of the inner border of the choana on either side, the distance separating the patches much less than the length of either.

Forelimb well developed; first, second and fourth fingers about equal in length; fingers pointed at tips, not dilated, without a groove separating the superior and inferior portions; subarticular tubercles large (except the distal one of the third finger), round to oval, only moderately protrudent; basal ones smaller and narrower; inner metacarpal tubercle very large, broadly oval, nearly in contact with the basal tubercle of the first finger; middle one of equal length but narrower; outer short, elliptical; terminal phalanx bluntly rounded; fingers without webs; hindlimb moderately long, length of tibia about 1/2 the length from snout to vent, heel reaching the anterior corner of the eye; toes long, in order of length 1, 2, 5, 3, 4; tips dilated into moderate, pointed disks with a deep, almost angular groove separating the dorsal and ventral portions; subarticular tubercles moderate, round to oval, more strongly protrudent than those of the fingers; inner metatarsal tubercle narrow-elliptical, its length greater than its distance from the distal end of the tubercle of the first toe, outer relatively large, round, metatarsal area smooth; toes without webs; dorsum nearly smooth except for two or three short, indistinct, light folds on either side on the pectoral and dorsolateral area and scattered fine tubercles posteriorly; upper lateral surfaces and inner proximal region of the thighs finely tuberculate; venter smooth.

Color (in preservative) of the dorsum and upper lateral surface purplish-brown with darker blotches in the middorsal area and enclosing the few light-colored folds; a wide, purplish-gray dorsolateral stripe extending posteriorly from either eye; loreal regions very dark;

margin of lips with wide, irregular, very dark, transverse bars; upper surfaces of limbs with broad, dark blotches or transverse bands; inner surface of thighs dark in the anal region, lightly speckled with purplish-brown distally; venter very light except for the dark blotches along the margin of the lower jaw.

Measurements	♀ (U.S.N.M. 119769)
Snout to vent	25 mm.
Snout length	3.5 "
Head length (to posterior edge of tympanum)	10 "
Head breadth	10.5 "
Eye diameter	3.5 "
Tympanum diameter	2 "
Tibia length	13 "

The paratype, a 16 mm. juvenile, has the same dorsal color pattern but is lightly speckled with reddish-brown on the venter anterior to the forelimb.

A third specimen, a 26 mm. female from Choiseul (A.M.N.H. 34733)[1], is also referred to this species. It agrees very well in the pointed fingers and toes, and the small size, but differs in the broader head, greater rugosity of the dorsum, large granules of the posterior venter and thighs and lack of the light-colored dorsolateral bands. The vomerine teeth are also smaller.

Platymantis myersi Brown

(Pl. 4, fig. 3; Pl. 8, fig. 2)

Rana solomonis (part), Burt and Burt, 1932, p. 491.

Platymantis myersi Brown, 1949, Amer. Mus. Nov., No. 1387: Bougainville Id. (Type in American Museum of Natural History).

2 (A.M.N.H. 35340, 35348, holotype) Bougainville Id. (Whitney Exped.).

1 (S.N.H.M. 9334) Bougainville Id. (Exch. Amer. Mus.) 1948.

1 (U.S.N.M. 119584) Torokina, Bougainville Id. (W. L. Necker).

In describing this species I suggested that it might be most nearly related to *P. vitianus*, but later work with members of this genus suggests probable closer affinities with *P. beauforti*.

Description. Head moderately broad; its breadth slightly less than its length, less than 3/4 the length of the tibia; snout relatively pointed, projecting beyond the lower jaw; eye large, its diameter about 1/3 the breadth of the head; nostril nearer tip of snout than eye; interorbital

[1] Burt and Burt (1932, p. 491) include this specimen in their list referred to *Rana solomonis*.

space much narrower than the upper eyelid; tympanum, covered with a thin skin, vertically oval, its diameter less than 1/5 the breadth of the head; vomerine teeth in two short, slightly oblique patches, the anterior vortex of the triangular bases between the choanae, the toothed crests behind the level of the choanae; tongue rather narrow, oval with a deep notch at the mid-point of the posterior border.

Forelimbs well developed; fingers long, the first and second approximately equal in length; the tips of the fingers expanded into distinct, round disks whose breadth is about 1½ times that of the adjacent phalanx, depressed with inferior pad separated from the superior portion by a deep, terminal, crescentic groove; subarticular tubercles large (except for the basal ones which are small, oval), round or broadly oval, only moderately protrudent; inner metatarsal tubercle prominent, elliptical, its length about equal to its distance from the mid-point of the distal subarticular tubercle of the first finger, middle one rather large, round or oval, outer moderate, narrow-elongate; hindlimb long, the length of the tibia more than 1/2 the length from snout to vent; toes long, slender, webbed at base; tips dilated, rounded, depressed with inferior pads separated from the superior part by a crescentic, dorsally subterminal groove; subarticular tubercles moderate, oval, distally pointed, inner metatarsal tubercle narrow, elongate, its length equal to its distance from the distal end of the subarticular tubercle of the first toe, outer distinct, small, round; metatarsal area slightly granulate or almost smooth.

Dorsum with only a few scattered swollen areas (except the posterior part which shows some tubercles as does the posterior part of the upper eyelids); lateral surfaces granulate and with short folds and tubercles, posterior venter and posterior aspect of thighs finely granulate.

Color of dorsum (in preservative) mottled dark grayish-brown with a somewhat indistinct darker brown blotch in the interorbital area; lateral surfaces and limbs browner; hands and feet dark grayish-brown; lips with three broad, dark-brown transverse bands which taper dorsally; venter more grayish than dorsum but heavily marbled with dark reddish-brown.

A small juvenile (U.S.N.M. 119584), which I refer to this species, measures 14.25 mm. from snout to vent. The body and limbs are slender. The fingers and toes are not dilated at the tips in this early juvenile stage but bluntly rounded. The venter is very dark, heavily mottled with brown as in the adult. The vomerine teeth, however, are quite inconspicuous although very prominent in the adult.

Measurements	♂ (S.N.H.M. 9335)	♀ (A.M.N.H. 35348)
Snout to vent	55 mm.	58 mm.
Snout length	9.5 "	11 "
Head length (to base of skull)	19 "	19.25 "
Head breadth	20.5 "	22.5 "
Eye diameter	7 "	8 "
Tympanum diameter	3 "	3.5 "
Tibia length	29 "	31 "

Range. Known at present only from Bougainville Island.

Platymantis papuensis weberi Schmidt

(Pl. 1, fig. 3; Pl. 4, fig. 4)

Platymantis solomonis (part), Barbour, 1921, p. 96.

Rana solomonis (part), Burt and Burt, 1932, p. 491.

Platymantis weberi Schmidt, 1932, Field Mus. Nat. Hist. Zool. Series, 18, p. 178: Tulagi Id., Solomon Ids. (Type in Chicago Natural History Museum).

17 (M.C.Z. 7487–96, 7498–99, 7501–04 + 1 uncat.) Tulagi Id. (W. M. Mann) 1916.
22 (M.C.Z. 7552–53, 7555–73, 7575) Isabel Id. (W. M. Mann) 1916.
4 (" 7582–84, 7587) Malaita Id. " "
3 (C.A.S. 49951, 49954–55) Guadalcanal Id. (J. A. Kusche) 1920.
1 (" 54667) Isabel Id. (Exch. Mus. of Comp. Zool.).
1 (S.N.H.M. 9341) Guadalcanal Id. (Exch. Amer. Mus. Nat. Hist.) 1948.
1 (S.N.H.M. 9340) Bougainville Id. (Exch. Amer. Mus. Nat. Hist.) 1948.
1 (A.M.N.H. 22857) Vangunu Id. (Whitney Exped.).
6 (A.M.N.H. 34258, 35303–05, 35328–29) Bougainville Id. (Whitney Exped.).
1 (A.M.N.H. 35396) Narovo Id. (Whitney Exped.).
1 (" 35439) Vella Lavella Id. " "

Schmidt (1932, p. 178) in describing *P. weberi* noted as distinctive characteristics its small size (based on males only), the shortness of the patches of vomerine teeth, the relatively acute snout, presence of numerous elongate dorsal folds and the presence of a terminal, crescentic, horizontal groove separating the inferior and superior portions of the slightly expanded disks at the tips of the fingers. He also stated that he regards Boulenger's reference (1888a, p. 90) of specimens from New Georgia and Guadalcanal Islands to *P. corrugatus* as being based on material of this species.

Actually *P. weberi* is much more closely related to *P. papuensis* (Meyer, 1874) of New Guinea from which it appears to differ in the

presence of a more distinct inner tarsal fold, more prominent and slightly wider folds on the dorsum; the greater rugosity of the solar area and the generally more distinct groove separating the inferior and superior portions of the minute disks of the finger. The folds on the dorsum of both these forms are like those of *P. corrugatus* but shorter and more numerous. The latter is a broader-headed species with hindlimbs longer and eyes smaller as noted by Loveridge (1948, p. 407). Close comparative examination of a series of these three populations leads one to conclude that *P. corrugatus* is a distinct species and that *P. papuensis* and *P. weberi* probably represent geographically isolated and subspecifically differentiated populations of the same species.

The significance of the differences between the means of various measurements of the populations concerned is summarized in the following tables.

	Mean of snout to vent length (in mm.) Male	Female	diff.	*t*	*n*	*P*
Platymantis papuensis papuensis Hollandia area, Dutch New Guinea	(N_1 = 11) 37.5 ±.42	(N_2 = 9) 51.67 ±1.08	14.17	13.12	18	highly significant
Platymantis papuensis weberi Isabel Id., Solomons	(N_1 = 7) 36.86 ±1.05	(N_2 = 13) 49.31 ±1.08	12.45	7.45	18	highly significant

	P. p. papuensis Dutch New Guinea (N_1 = 20)	*P. p. weberi* Isabel Id. (N_2 = 19)	diff.	*t*	*n*	*P*
Breadth of head / Length snout to vent	38.20 ± .29	38.48 ± .20	0.19	0.54	37	> .5
Breadth of head / Length of tibia	73.82 ± .96	76.14 ± .70	2.30	1.918	37	> .05
Length of tibia / Length snout to vent	52.34 ± .53	50.67 ± .39	1.67	2.506	37	< .02

Both populations exhibit a pronounced sexual dimorphism when snout to vent lengths for males and females are compared; the difference between the means in either case is highly significant. The males are much smaller than the females.

There is no significant difference in body proportions, except perhaps for the length of the tibia in relation to the snout to vent length, between New Guinea and Solomons populations.

Description. Head slightly less broad than long; its breadth generally less than 2/5 the length of the body (38.48% ± .20 for 19 specimens from Isabel Island), about 3/4 the length of the tibia (76.14% ± .70 for 19 specimens); snout round-pointed, relatively more pointed than for *P. solomonis*; nostril nearer tip of snout than eye; eye moderately large, its diameter about 1/3 the breadth of the head (33.71% ± .364 for 19 specimens); interorbital space less than the breadth of the upper eyelid; tympanum large, its diameter generally about 1/5 the breadth of the head (22.56% ± .625 for 19 specimens); vomerine teeth in two short, rather widely separated, oblique patches generally posterior to the choanae; tongue moderate, oval with a rather wide, deep notch at the mid-point of the free, posterior margin.

Forelimb well developed; first finger longer than the second; finger tips slightly dilated, usually somewhat depressed with a shallow but generally distinct, terminal, crescentic groove separating the inferior and superior parts of the disk at the distal and lateral margins; subarticular tubercles other than the basal ones large, round, about as broad as the subtending digit, strongly protrudent and tending to be pointed distally; basal ones smaller, round, weakly protrudent; inner metacarpal tubercle broadly elliptical, its length about equal to its distance from the distal tubercle of the first finger; middle one shorter, broadly oval; outer much shorter, oval or elliptical; hindlimb moderate, length of tibia about 1/2 the length of the body (50.67% ± .39 for 19 specimens); tips of toes moderately dilated, depressed, the inferior pad of the disk separated from the superior part by a deep, terminal, crescentic groove; subarticular tubercles round to broadly oval, strongly protrudent and pointed distally; solar area prominently tuberculate; inner metatarsal tubercle moderately broad, elliptical, its length about equal to its distance from the distal end of the tubercle of the first toe; outer moderate, round, strongly protrudent; a low tarsal fold extending proximally from the base of the inner metatarsal tubercle; toes without webs; dorsum with short to moderate, narrow folds generally displaying a pattern of about eight longitudinal rows anteriorly and diminishing posteriorly; rugose with small tubercles between the folds of the dorsum, the upper eyelids, loreal areas, upper lateral surfaces and the upper proximal surfaces of the hindlimbs;

lower abdomen and posterior thighs with moderate flat granules; under surface of head of males generally finely granulate.

Color (in preservative) of the dorsum light-brown to dark reddish-brown, often with darker blotches and dark interorbital bar, frequently with a wide purplish-gray dorsolateral band on each side, occasionally with bright red markings in association with some of the folds and tubercles on dorsum and limbs; margins of lips with more or less distinct, irregular transverse, dark bars; loreal region sometimes very light; upper surface of thighs and tibial region with wide, dark transverse bars or blotches; venter uniformly light or more or less powdered or marbled with brown anterior to the forelimbs.

Ovarian eggs are large and unpigmented.

Measurements	♂ (M.C.Z. 7562)	♀ (M.C.Z. 7560)
Snout to vent	40 mm.	56 mm.
Snout length	7 "	10 "
Head length (to posterior edge of tympanum)	16 "	22 "
Head breadth	15 "	21 "
Eye diameter	5 "	8 "
Tympanum diameter	4 "	4 "
Tibia length	19 "	27 "

Range. (See distributional chart).

Platymantis solomonis (Boulenger)

(Pl. 1, fig. 4; Pl. 2, fig. 1; Pl. 4, fig. 1)

Cornufer solomonis Boulenger, 1884, Proc. Zool. Soc. London, p. 212: Fauro, Treasury and Shortland Ids. (Type in British Museum).
Platymantis solomonis, Boulenger, 1918b, p. 372.
Platymantis solomonis (part), Barbour, 1921, p. 96.
Rana solomonis (part), van Kampen, 1923, pp. 191–192.
Rana solomonis (part), Burt and Burt, 1932, p. 491.

1 (M.C.Z. 3499) Stirling Id. (Exch. Brit. Mus.).
3 (" 7444, 7554, 7561) Isabel Id. (W. M. Mann) 1916.
2 (" 7497, 7500) Tulagi Id. " 1916.
1 (" 7581) Malaita Id. " 1916.
2 (" 7585–86) New Georgia Id. " 1916.
6 (" 26085–89 — 1 uncat.) Stirling Id. (L. W. Jarcho) 1945.
1 (" 72080) New Georgia Id. (Crocker Exped.) 1933.
2 (M.V.Z. 44948–49) Munda, New Georgia Id. (C. G. Sibley) 1944.
1 (S.N.H.M. 8393) Torokina Pt., Bougainville Id. (J. P. Heath) 1943.

12 (U.S.N.M. 119590–93, 119776–81) Torokina Pt., Bougainville Id. (W. L. Necker and D. H. Johnson).
1 (U.S.N.M. 119594) Puruata Id.
18 (A.M.N.H. 34257, 35259–60, 35306, 35308–11, 35314–15, 35317, 35320–26) Bougainville Id. (Whitney Exped.).
1 (A.M.N.H. 22856) Vangunu Id. (Whitney Exped.).
1 (" 35386) Arnavon Id. " "
1 (" 35389) Choiseul Id. " "
1 (" 35391) Mono Id. " "
1 (" 39997) Malaita Id. " "

Boulenger (1884, p. 212) based his description on specimens from the small islands near the southern end of Bougainville, noting such characteristics as the large head and eyes, tips of fingers swollen rather than dilated, interorbital distance less than breadth of upper eyelid, and dorsal surfaces slightly rugose with short longitudinal folds. His figure (1886, pl. xi, fig. 2) well illustrates this large eyed, moderately or but slightly rugose species which is widely distributed in the Solomons. This very large species may have its closest affinities with *P. vitianus*.

Subspecific populations are very strongly suggested when series from different island groups are carefully examined. However, since the only samples available containing five specimens or more, of either sex are those from Bougainville, Stirling and New Georgia Islands, no well defined geographical limits can be determined for the suggested subspecies. Consequently no predictions are made at this time.

Description. Head about as broad as long; its breadth almost 2/5 the length from snout to vent (37.77% ± .434 for 11 specimens from Bougainville Island), 3/4 to 4/5 the length of the tibia (77.19% ± .908 for 11 specimens); snout round or round-pointed, only slightly protrudent beyond the lower jaw; nostril nearer tip of snout than eye; eye large, its diameter more than 1/3 the breadth of the head (37.37% ± .555 for 11 specimens), tympanum round, large, its diameter about 1/5 to 1/4 the breadth of the head; vomerine teeth in two strongly protrudent, oblique or transverse patches with the crests posterior to the choanae and the outer angle of the bases extending outward beyond the sagittal plane of the inner border of the choana or either side, the distance separating the patches slightly more or less than the length of either; tongue rather broadly oval with a narrow to broad cleft at the mid-point of the posterior free margin.

Forelimb well developed, first finger longer than the second; tips of fingers swollen and not or scarcely dilated, without a groove separating inferior and superior portions; subarticular tubercles large, distal ones about as broad as the subtending digit; round or somewhat oval,

strongly protrudent; inner metacarpal tubercle broadly elliptical, its length about equal to its distance from the subarticular tubercle of the first finger; middle one broadly oval, shorter; outer narrower; hindlimb moderately long; length of tibia about 1/2 the length from snout to vent (49.79% ± .513 for 11 specimens); tips of toes dilated into small disks, the inferior portion separated from the superior by a crescentic, terminal groove; subarticular tubercles oval, smaller than on hands, strongly protrudent and pointed distally; solar area strongly tuberculate; inner metatarsal tubercle narrow elliptical, its length equal to its distance from the distal end of the tubercle of the first toe; outer round, strongly protrudent; toes without webs; dorsum only moderately rugose with scattered, short, relatively broad folds or tubercles, very nearly smooth for larger, older females; lateral surfaces granulate or with some tubercles; venter granulate posteriorly and on the inner surface of the thighs.

Color (in preservative) of the dorsum grayish-brown to reddish-brown or blackish-brown often with darker blotches; limbs often lighter; thighs and tibial regions with more or less distinct, wide, transverse bars or blotches; margin of lips with more or less distinct, broad, dark transverse bars; lower lateral surfaces lighter, powdered or marbled with darker shades; venter white, grayish or pale-brown posteriorly, generally powdered or marbled with brown or reddish-gray anterior to the forelimbs.

Ovarian eggs are large and unpigmented.

Measurements	♂ (U.S.N.M. 119392)	♀ (U.S.N.M. 119591)
Snout to vent	49 mm.	66 mm.
Snout length	9 "	11 "
Head length (to posterior edge of tympanum)	20 "	26 "
Head breadth	18 "	25.5 "
Eye diameter	7 "	9 "
Tympanum diameter	4 "	4 "
Tibia length	25.5 "	31 "

Range. (See distributional chart).

Genus RANA Linné

The genus *Rana* is represented in the Solomon Islands by two known populations of the subgenus *Hylarana*. *Rana papua krefftii* occupies only the extreme southwestern islands of the San Cristobal group. The subspecies represented in the other groups, so far as known, is here referred to *Rana papua novaebritanniae*, although subspecific

identity of the Bismarcks and northern Solomons populations may be shown to be in error when a large number of specimens from the former locality become available for comparison.

Some of the specimens in the limited collections from Guadalcanal and Malaita which I have been able to examine are somewhat intermediate between these two populations. However, since they agree in most characteristics with *R. papua novaebritanniae*, I have assigned them here until such time as more material is available from these island groups as well as the interlying Choiseul and Isabel groups.

These two subspecies may be distinguished as follows:

Tympanum large, its diameter more than 1/4, generally more nearly 1/3 the breadth of the head; disks of toes small, oval; snout generally rounded, little protrudent; venter whitish or light, not or little mottled with blotches of brown ..... *papua novaebritanniae*

Tympanum moderate, its diameter generally less than 1/4 the breadth of the head; disks of toes moderate, somewhat pointed; snout moderately pointed, generally protrudent; venter usually mottled with large brown blotches . . . *papua krefftii*

Rana papua krefftii Boulenger

(Pl. 6, fig. 1)

Hylarana erythraea (part), Günther, 1858, p. 73.
Rana krefftii Boulenger, 1882, Cat. Batr. Sal. Brit. Mus., p. 64, pl. iii, fig. 2: San Cristobal Id. (Type in British Museum).
Rana (*Hylarana*) *krefftii* (part), Boulenger, 1918a, pp. 239–41.
Rana krefftii (part), Barbour, 1921, pp. 97–98.
Rana krefftii (part), van Kampen, 1923, pp. 206–07.
Rana krefftii (part), Kinghorn, 1928, pp. 125–26.

1	(M.C.Z. 2517) Solomon Ids.	(W. M. Mann)	1916.
46	(" 7432–34, 7505–47) Bio Id.	"	"
1	(" 7440) San Cristobal Id.	"	"
1	(" 7447) Santa Ana Id.	"	"
4	(U.S.N.M. 63402–05) Bio Id.	"	"
1	(C.A.S. 54666) San Cristobal Id.	"	"

Boulenger (1882, p. 64) described *R. papua krefftii* on the basis of two specimens, one from San Cristobal Island and one with the more general locality designation of Solomon Islands. In view of the fact that well differentiated subspecies occupy different geographical areas within the Solomon Islands, I designate San Cristobal as the type locality of *R. papua krefftii*.

Description. Head less broad than long, its breadth about 1/3 the

length from snout to vent (34.75% ± .34 for 5 specimens from Bio and San Cristobal), about 2/3 the length of the tibia (66.43% ± 1.44 for 5 specimens); snout pointed, generally strongly protrudent beyond the lower jaw; nostril nearer tip of snout than eye; eye moderate, its diameter 1/3 to about 2/5 the breadth of the head (36.8% ± 1.136 for 5 specimens); tympanum moderate, its diameter generally less than 1/4 the breadth of the head (22.02% ± .277 for 5 specimens); interorbital space less than, or equal to, the breadth of the upper eyelid; loreal region nearly vertical, concave; canthus rostralis angular; vomerine teeth in two oblique patches between the choanae, the distance separating them generally less than the length of either; tongue oval with a moderate to broad, rounded notch at the mid-point of the posterior, free margin.

Forelimb well developed; fingers long, slender, the first longer than the second; tips dilated into somewhat pointed disks nearly as large as those of the toes, a rather angular groove (frequently incomplete at the vertex) separating the distally narrower, inferior pad from the superior portion; subarticular tubercles round or broadly oval, generally more protrudent distally, nearly as broad as the subtending digit (except the basal ones which are low and somewhat narrow elliptical); inner metatarsal tubercle broadly elliptical, its length less than its distance from the distal end of the distal tubercle of the inner finger; middle one shorter, broadly oval, outer narrow elliptical; fingers without webs; males with a prominent humeral gland; hindlimb long; length of tibia about 1 2/5 to slightly more than 1 1/2 times the breadth of the head; toes long; tips dilated into moderate, somewhat pointed disks, the inferior pad separated from the superior portion by a deep, distally complete, somewhat angular groove; subarticular tubercles small, narrow elliptical, its length less than its distance from the subarticular tubercle of the inner toe; outer one small, round; toes webbed to the distal tubercle or almost the disk except the fourth which is webbed only to the penultimate or occasionally the distal tubercle on the inside; outer metatarsals separated to base; a distinct outer metatarsal fold present; skin of the dorsum generally rather smooth; upper surfaces of the limbs with very fine longitudinal folds; lateral surfaces nearly smooth or moderately granulate; venter nearly smooth or finely granulate posteriorly; inferior and inner surfaces of the thighs granulate at least proximally.

Color (in preservative) of dorsum reddish-brown, occasionally olive-brown, but generally lighter than for *R. papua novaebritanniae*; lateral surfaces of head and upper lateral surfaces of body dark reddish-brown to almost blackish-brown, bordered ventrally by a narrow light band beginning anteriorly at the angle of the jaws; lower lateral surfaces

mottled with brown; margin of lips generally suffused with brown; upper surface of limbs lighter to same color as the dorsum, thigh and lower leg barred or irregularly blotched with dark-brown; venter, especially on the head and throat, heavily blotched with brown, or occasionally only retaining the dark-brown on the ventral margin of the lower jaw and the pectoral blotches.

Ovarian eggs small and heavily pigmented at the animal pole region.

Measurements	♂ (M.C.Z. 7533)	♀ (C.A.S. 54666)
Snout to vent	52 mm.	82 mm.
Snout length	8 "	13.5 "
Head length (to posterior edge of tympanum)	20 "	32 "
Head breadth	17 "	29 "
Eye diameter	5 "	10.75 "
Tympanum diameter	4.5 "	6.5 "
Tibia length	27 "	41 "

Range: (See distributional chart).

Rana papua novaebritanniae Werner

(Pl. 6, fig. 4)

Rana novaebritanniae Werner, 1894, Zool. Anz., 17, p. 155: New Britain. (Type in Berlin).
Rana (Hylarana) krefftii (part), Boulenger, 1920, pp. 186–88.
Rana papua, Sternfeld, 1920 (1921), p. 433.
Rana krefftii (part), Barbour, 1921, pp. 97–98.
Rana krefft (part), van Kampen, 1923, pp. 206–07.
Rana krefftii (part), Kinghorn, 1928, pp. 125–26.
Rana krefftii, Schmidt, 1932, p. 180.
Rana krefft (part), Hediger, 1934, pp. 451, 486.
Rana krefftii, Slevin, 1934, p. 184.

2 (M.C.Z. 7442–43) Isabel Id. (W. M. Mann) 1916.
2 (" 7445–46) Tulagi Id. " "
(?)1 (" 7448) Santa Cruz Id.[1] " "
15 (U.S.N.M. 119611–23, 119774–75) Torokina, Bougainville Id. (W. L. Necker).
2 (M.V.Z. 44192, 44222) Guadalcanal Id. (J. Chattin) 1944.
5 (C.A.S. 72076–79, 72166) Malaita Id. (Crocker Exped.) 1933.

Description. Head less broad than long, its breadth about 1/3 the length from snout to vent (33.67% ± .318 for 15 specimens from Bougainville Island) and about 2/3 the length of the tibia (67.65% ± .984 for 15 specimens); snout round-pointed, little protrudent; nostril

[1] Exact locality for this specimen is in doubt; it is almost certainly some other island.

nearer tip of snout than eye; eye large, its diameter about 2/5 to nearly 1/2 the breadth of the head (40.74% ± .759 for 15 specimens); tympanum large, round, its diameter 1/4 to 1/3 the breadth of the head (31.93% ± .617 for 15 specimens); interorbital distance less than the breadth of the upper eyelid; loreal region nearly vertical, somewhat concave; canthus rostralis rather angular; vomerine teeth in two short, oblique patches between the choanae, the distance separating them less than the length of either; tongue generally narrow-oval with a deep, narrow, rounded notch at the mid-point of the free posterior margin.

Forelimb well developed; fingers long, the third finger longer than the snout, first longer than the second; tips of fingers dilated into moderate, oval or slightly pointed disks about the same size as those of toes, with a prominent terminal, semicircular groove separating the inferior pad from the superior portion; subarticular tubercles large, oval; inner metacarpal tubercle elliptical, about twice as broad as long, its length equal to its distance from the distal end of the tubercle of the inner finger; middle one shorter, almost as broad as long; outer short and narrow; fingers without webs; male generally with humeral gland present; hindlimb long; heels moderately overlapping when the hindlimbs are placed at right angles to the body; heel of the appressed limb reaching the loreal region; length of tibia about 1/2 the length from snout to vent (49.97% ± .577 for 15 specimens); tips of toes dilated into moderate, oval disks, the inferior pad less broad than the superior portion and separated from it by a semicircular groove as in the fingers; subarticular tubercles small, oval, more strongly protuberant distally; inner metatarsal tubercle elliptical-elongate, 2 to 2½ times as long as broad, shorter than its distance from the distal end of the subarticular tubercle of the inner toe, outer moderate, round; toes webbed to a point between the distal tubercle and the disk except for the fourth and the third on the inside where the web reaches the penultimate tubercle or beyond; skin of the dorsum almost smooth or finely granulate posteriorly; venter smooth; proximal region of the posterior surface of the thighs and anal area granulate.

Color (in preservative) of the dorsum dark-reddish or grayish-brown, raised tubercles, where present, darker; upper lateral surfaces of head and body blackish-brown, bordered dorsally by the moderately narrow, light dorsolateral fold; white or dusky gray coloration of upper lip continuous with the narrow, light stripe along the upper lateral surface from the angle of the jaw to the groin; lower lip white or dusky; venter white or occasionally powdered with brown or gray anteriorly; upper surface of limbs grayish or brown; lighter than body; thigh and lower leg with broad, dark transverse bars; posterior thighs mottled with

blackish-brown; a large brown blotch on the outer inferior surface of the upper arm; lower thighs whitish or somewhat mottled with grayish-brown; under surface of hands and feet grayish-brown.

Ovarian eggs are small and darkly pigmented in the animal pole region.

Measurements	♂ (U.S.N.M. 119611)	♀ (U.S.N.M. 119616)
Snout to vent	50 mm.	51 mm.
Snout length	8 "	8.25 "
Head length (to posterior edge of tympanum)	20 "	20 "
Head breadth	18.5 "	17 "
Eye diameter	7 "	7 "
Tympanum diameter	5 "	5 "
Tibia length	25 "	26 "

Range. (See distributional chart).

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PLATES

PLATE 1

Fig. 1. *Batrachylodes vertebralis* Boulenger, pectoral girdle (ventral view)
Fig. 2. *Discodeles bufoniformis* (Boulenger), pectoral girdle (ventral view)
Fig. 3. *Platymantis papuensis weberi* Schmidt, pectoral girdle (ventral view)
Fig. 4. *Platymantis solomonis* (Boulenger), pectoral girdle (ventral view)
Fig. 5. *Palmatorappia solomonis* (Sternfeld), pectoral girdle (ventral view)
Fig. 6. *Cornufer guppyi* Boulenger, pectoral girdle (ventral view)

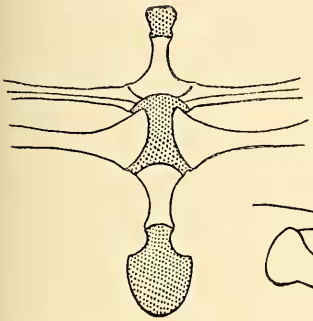


Figure 1

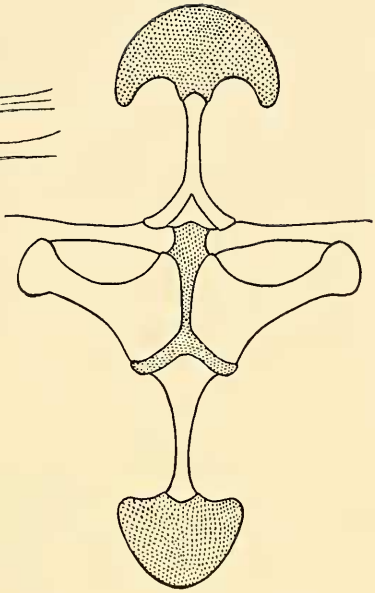


Figure 2

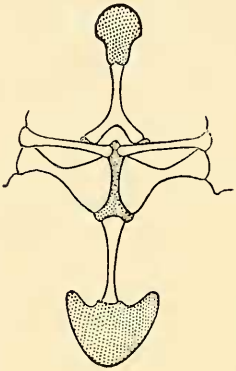
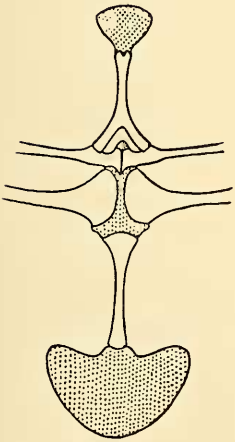


Figure 3



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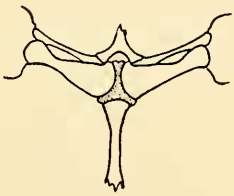

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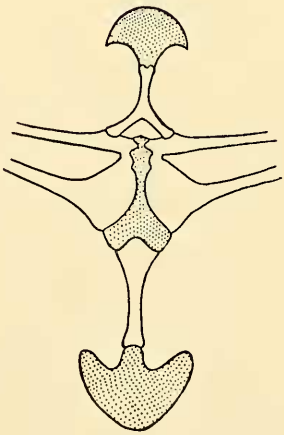


Figure 6

PLATE 2

Fig. 1. *Platymantis solomonis* (Boulenger), terminal phalanx
Fig. 2. *Batrachylodes vertebralis* Boulenger, terminal phalanx
Fig. 3. *Cornufer guppyi* Boulenger, terminal phalanx
Fig. 4. *Discodeles bufoniformis* (Boulenger), terminal phalanx
Fig. 5. *Ceratobatrachus guentheri* Boulenger, terminal phalanx

Figure 1

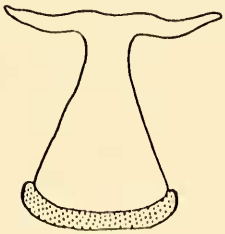


Figure 2

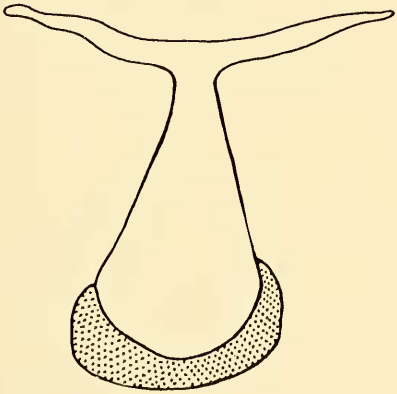


Figure 3

Figure 4

Figure 5

PLATE 3

Fig. 1. *Hyla thesaurensis* Peters, head of larva
Fig. 2. *Hyla thesaurensis* Peters, inferior view of hand

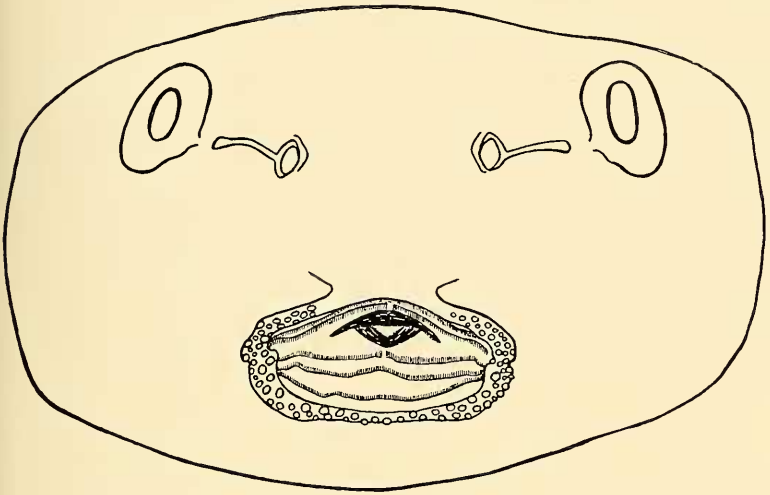


Figure 1

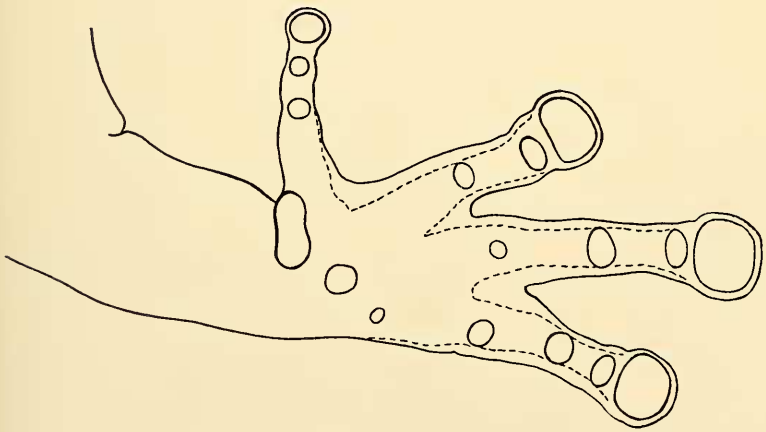
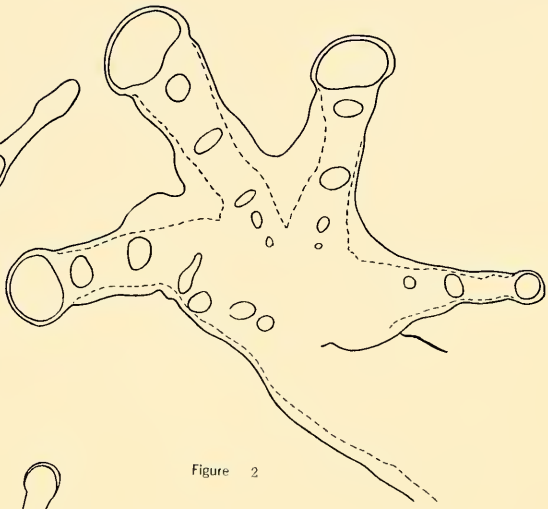


Figure 2

PLATE 4

Fig. 1. *Platymantis solomonis* (Boulenger), inferior view of hand
Fig. 2. *Hyla lutea* Boulenger, inferior view of hand
Fig. 3. *Platymantis myersi* Brown, inferior view of hand
Fig. 4. *Platymantis papuensis weberi* Schmidt, inferior view of hand

Figure 1



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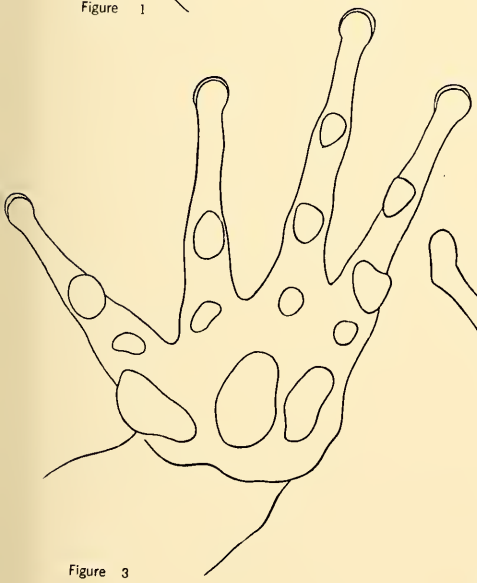

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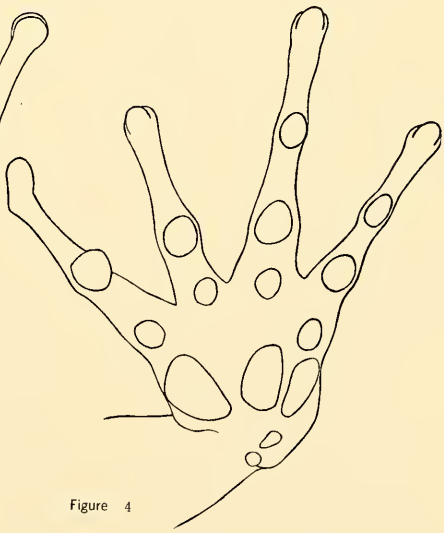

Figure 4

PLATE 5

Fig. 1. *Platymantis aculeodactylus* Brown, inferior view of hand
Fig. 2. *Ceratobatrachus guentheri* Boulenger, inferior view of hand
Fig. 3. *Palmatorappia solomonis* (Sternfeld), inferior view of hand
Fig. 4. *Cornufer guppyi* Boulenger, inferior view of hand

Figure 1

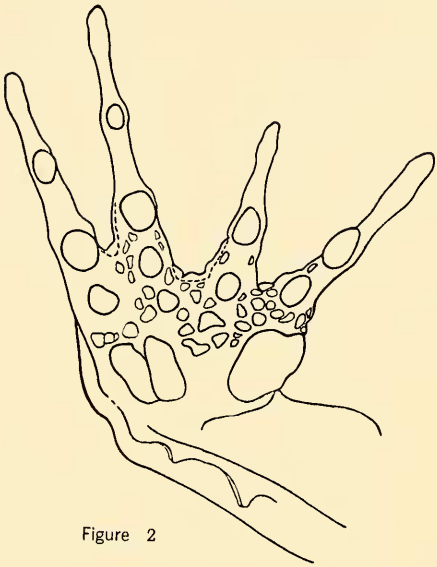

Figure 2

Figure 3

Figure 4

PLATE 6

Fig. 1. *Rana papua krefftii* Boulenger, inferior view of hand
Fig. 2. *Batrachylodes vertebralis* Boulenger, inferior view of hand
Fig. 3. *Batrachylodes trossulus* Brown and Myers, inferior view of hand
Fig. 4. *Rana papua novaebritanniae* Werner, inferior view of hand

Figure 1

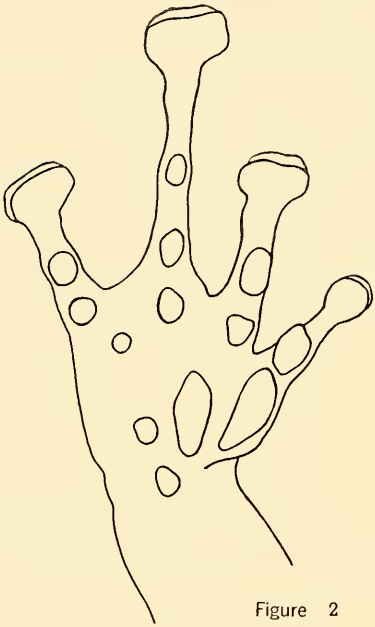

Figure 2

Figure 3

Figure 4

PLATE 7

Fig. 1. *Discodeles opisthodon* (Boulenger), ventral view of foot
Fig. 2. *Discodeles opisthodon* (Boulenger), ventral view of hand
Fig. 3. *Discodeles bufoniformis* (Boulenger), ventral view of hand

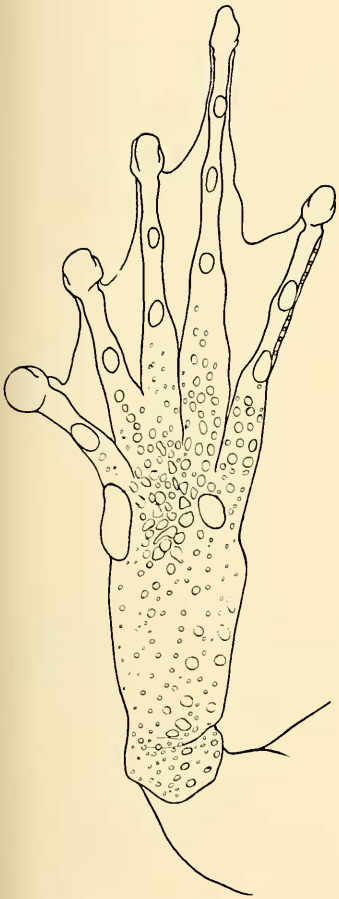

Figure 1

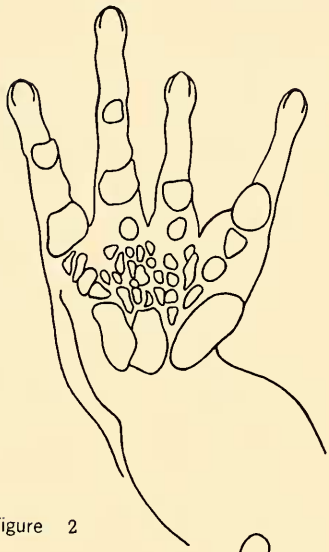

Figure 2

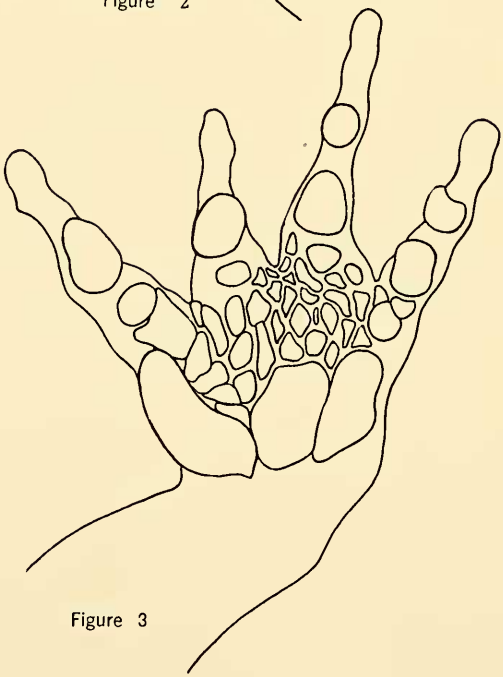

Figure 3

PLATE 8

Fig. 1. *Batrachylodes trossulus* Brown and Myers
Fig. 2. *Platymantis myersi* Brown

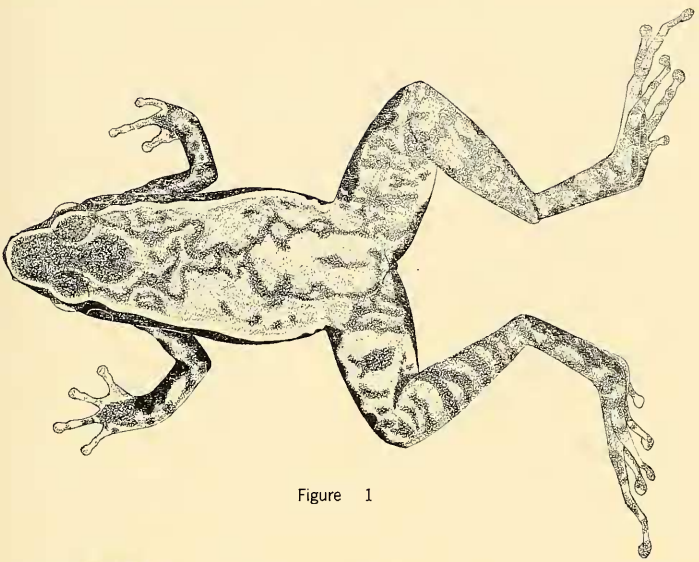

Figure 1

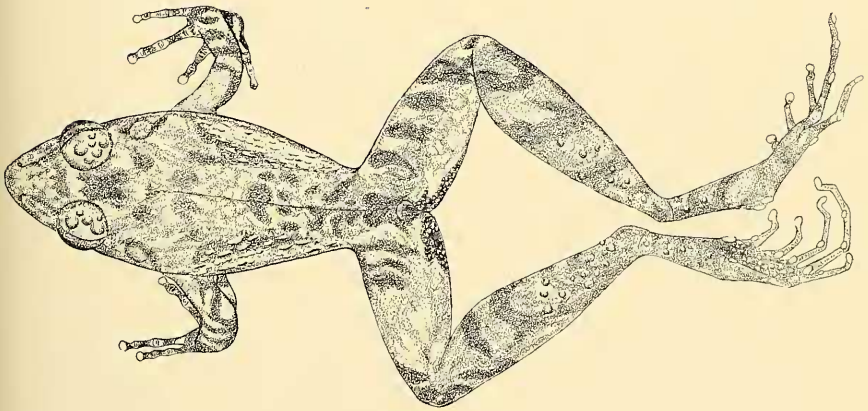

Figure 2